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ABSTRACT

Summarized are the findings of a two-year survey of Australia's field studies facilities and related educational programs. Following a literature survey and brief accounts of some environmental centers in other countries is a state-by-state description of field studies centers in Australia. For each state, the programs, staffing, and facilities at several areas are presented. Also examined are the roles of the National Park System and the Department of Education in environmental education. The report concludes with an evaluation of existing centers and recommendations for future development. Appended are some field activities and addresses of Australian field studies centers. (WB)

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A Survey of Field Studies Centres in Australia

Joan B. Webb

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Special
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Australian
National Parks
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Service

AUSTRALIA

A Survey of Field Studies Centres in Australia

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Special Publication
[4]

Australian
National Parks
and Wildlife
Service

Kuring-gai
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Cover photographs by Allan Fox

Front: Taking note of nature
Muogamarra Nature Reserve, NSW.

Back: Expressing an interpretation of nature
Myuna Bay National Fitness Camp School

FOREWORD

Big Bill Neijie, traditional Aboriginal owner of the Obiri area of Kakadu National Park commented on the overhunting of magpie geese, "I don't want to see the geese go, they are in my blood." Big Bill, like the Indian Chiefs of North America was eloquently describing his relationship with environment.

This kind of relationship where humans and environment were one has seemingly got lost in the ascent of technological man. Environment instead of being part of humans has become a chattel to be owned, bought, sold and frequently abused.

Accelerated erosion, acid rain, diminishing productivity, desertification, pollution and wildlife extinctions are growing problems caused by the breakdown of natural processes and are beginning to threaten human existence.

Native cultures grew out of an immediate dependence upon nature.The landscape was often seen as a very personal entity created by the same ancestral beings who created the people so that to harm such a place was to harm living persons.

Technological man has lost this personal view of nature and no longer feels a need to be concerned about the possible effects of individual action. The complexity of modern life has given us an anonymity — "It is someone else's problem".

Joan Webb in this study looks critically at a new branch of education which may become a positive force in bringing people back to earth once again. She examines the field study centres, their programs and how these might help the children of our technological civilization to personalise their landscapes.

The study is a timely review of this field of education. Teachers and resources adequate to the task are not common so let us use them wisely.

The Australian National Parks and Wildlife Service has been privileged to have been able to make the study possible and to have been able to join with the Kuring-gai College of Advanced Education in making the results available to educationists and the public. I hope that any areas for which the Australian National Parks and Wildlife Service has responsibility contribute effectively to this re-orientation of human values.

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Australian National Parks and Wildlife Service
P.O. Box 636, Canberra City. A.C.T. 2601.

A Survey of Field Studies Centres in Australia

April, 1980.

Joan B. Webb
M.A. B.Sc. Dip. Ed.

In March, 1978, Kuring-gai College of Advanced Education, Lindfield, New South Wales, was appointed by the Director of the Australian National Parks and Wildlife Service as a Consultant to survey the existing network of field studies centres in each State of Australia. Ms. Joan B. Webb was nominated as Chief Investigator.

Acknowledgement is given to those people, too numerous to mention by name, who overseas and in Australia gave freely of their time and friendship to make this report possible.

All photographs appearing in this report were taken by the author.

A SURVEY OF FIELD STUDIES CENTRES IN AUSTRALIA

Joan B. Webb

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INTRODUCTION

It was the 4th of July, 1979. John Walton, the Director of the Lucy Evans Baylands Nature Interpretive Center, had closed the doors for half an hour to drive in to the nearby city of Palo Alto to meet an Australian visitor arriving by bus from San Francisco. As he returned, other visitors were waiting, walking around the open deck that faced in all directions on to the saltmarsh meadows of San Francisco Bay. John, one of two full-time naturalists at the center, was on duty this special holiday; he set the slide show going in the auditorium, and started the family group working on a marine life project in the laboratory. John led his overseas visitor out to the boardwalk (it covers a total of two miles) and they walked over the saltmarsh, part of a rapidly dwindling habitat that is now the centre of a community programme — a programme designed to develop in young and old an awareness which will hopefully lead to wise decisions based on knowledge. The citizens of Palo Alto asked for this center; John and his assistant are employees of the City of Palo Alto; support during a seven day week comes from a group of thirty volunteers who undergo a short training programme to enable them to work as assistants.

From this vantage point out on the marshes one could look back at the centre; the aesthetically pleasing building fitted in with the marshes — it was designed by an architect who himself had an empathy for marshes; the timber is very durable redwood, pressure treated to overcome termites and salt water problems; the walls are rustic, roughened timber; the open deck extends right around the building, and full-length glass windows look out on the marshes. The building is functional and multi-purpose, containing a laboratory with adequate working and storage space, an auditorium with movable chairs, and a display area for an aquarium and general information on the ecology of the area.

> Is this an example of the ideal environmental centre?
> Does this centre cater for a certain set of objectives, a certain clientele, and as well, a certain environment?

This report outlines a two-year study which attempted to answer a number of questions including —

> What is the ideal environment centre?
> How does one define an environment centre, or field studies centre?
> What has been Australia's response to facilities for the outdoor education movement?
> Should the National Parks Service be involved in the expanding area of environmental education?

It is the author's concern that in the pages that follow, the reader will develop not only an interest in this growing field, but develop also a concern for the policies of the future. We need Australians with a sense of responsibility for the strategies to be developed to ensure that not only our primary school children, but adults, young and old, may be exposed to the reality of rapidly dwindling resources, areas of conflict, and expanding urbanism. This new awareness must be based on knowledge.

> I went to the woods because I wished to live deliberately, to front only the essential facts of life, and to see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived.
>
> *Henry Thoreau 1817-1862*

CHAPTER 1 — LITERATURE SURVEY:

The literature reveals that, like so many things in education, "Field studies" and "field studies centres" mean different things to different people. To Haworth (1977) "field studies" is a "flavour" — even an "attitude of mind" — which runs through the curriculum of each year within the school.

Bird (1965) gave this description of field studies:-

"Field studies comprise those aspects of biology and earth sciences which require observation and experimental work out of doors. The simplest form of field work is the collection of material (rocks and fossils, soil and water samples, plant and animal specimens) to be taken back to a laboratory for further study and analysis, but more important is the study of the ecology of organisms and communities in relation to their environment under natural or near-natural field conditions".

To-day, fifteen years later, this definition is rather narrow and confined, because field studies has come to include all aspects of the natural and man-made environment, and includes for study at the Field Centres in England such topics as Drawing and Painting in the Environment, How to write Local History, Archaeology and Nature Photography.

Herbert et al (1972) discuss outdoor or field experience under three main classifications: Curricular, Recreational, and Social, the curricular activities being academic or aesthetic, the recreational being aesthetic or physical, and the social aspect involving both individual and communal development. Although it is undesirable to try to define sharp boundaries between these aspects of field studies, it is stressed that the degree of their overlap will clearly depend upon the age and stage of development of the students involved.

Pearson (1978) defines "centres" as "places with structures designed or modified to facilitate interpretation and/or use of a particular area for fieldwork". This definition necessarily includes many venues other than those titled centres. For example, Pearson would include the porpoise pool at Marineland in Southport, Queensland because this pool is a structure with associated diving boards and grandstand, all designed to facilitate the sensory out-of-doors experience. Similarly, she includes zoos because they have structures such as animal enclosures, auditoriums and outdoor tables. Nature reserves may only have walking tracks, but since tracks do facilitate access for fieldwork and are man-made, the reserve is classified by Pearson as a field studies centre.

In 1970, Piesse and Strom, quoting from submissions made in 1969 in New South Wales concerning the establishment of field studies centres, pinpoint three critical elements which characterize such centres:

1. suitable site or sites to demonstrate the principles or phenomena sought by teachers. (This is a land management problem.)
2. suitable staff to provide the background teaching material and the actual field teaching (an education problem).
3. suitable building or buildings with a lecture room, display room, simple field laboratory, library, and in some cases, accommodation. This could be a matter for co-operation between the land management and education authorities.

Piesse (1979, personal interview) is now of the opinion that "field studies centre" is an old-fashioned term — "field" is delimiting, and has the U.K. connotation of the "field", i.e. emphasis on ecological studies in the field, with separate areas for "urban" studies. He goes on to say that "environment study centre" is a preferred title since it has a wider implication — covers the urban and rural environment, i.e. the **total** environment, and implies social and economic aspects as well.

Meyer (1972) appears to support this view. He quotes from a publication of the National Park Service in the United States:

> "An environmental study area program may include a historical tour, a nature walk, or a visit to the city dump, but the most rewarding result of an environmental study area experience is something that places the individual and his own culture into an environmental perspective. The emphasis on environmental awareness should synthesize fragments of learning about man and his environment into a whole."

Meyer believes the word "synthesize" is of special importance. He goes on to say that we do not face our environment geographically, biologically or health-wise, but totally. Environmental studies centres must, therefore, cut across traditional academic subject boundaries and develop new programmes catering for more than specialised sectional interests.

In a 1978 paper on Coolart, a proposed site for a centre in Melbourne, Piesse outlined what he now considers to be the pre-requisites for an environment study centre. Due to general agreement with these criteria, the author of this study considers these to be the basis of the working definition for a field studies centre:

1. a suitable building or complex of buildings furnished and equipped to meet the needs of the users and the centre's programme.
2. proximity to an area of accessible environmental resources providing a contrast of landscapes and land uses and offering a diversity of natural, semi-natural and man-made sites for purposes of environmental studies.
3. a clearly defined conservation and educational policy or plan aimed at persons both within the formal education system and outside it.
4. leadership by an autonomous professional warden with full responsibility for initiating, developing and running the educational and any on-going research programmes in a creative and flexible way.

In the United States, although a variety of facilities exist for the promotion of conservation education and field studies, the most rapid expansion has occurred in the establishment of the community nature center. The National Audubon Society has a Nature Center Planning Division and from its several publications the elements and objectives of such a center may be learned.

A nature center can be defined as an area of undeveloped land near or within a city or town and having on it the facilities and services designed to conduct community outdoor programs in natural sciences, nature study and appreciation and conservation. It is, in essence, an outdoor focal point where the citizens of a community, both young and old, can enjoy a segment of the natural world and learn something about the interrelationship of living and non-living things, including man's place in the ecological community. Thus conceived, a dynamic and operating nature center provides innumerable educational, scientific, cultural and recreational benefits to the community, values that are far-reaching at the local level where the sinews of any free society are built.

A nature center or outdoor education area is not a hard and fast proposition. It can take and has taken many forms. It can, for example, be a 50 acre natural tract developed primarily for outdoor education in a city or county park. It can be an educational section of a state or national forest or park set aside specifically to serve the people of one or several nearby communities. It can be an educational natural area established and run by a conservation group serving its members and other resource-minded groups.

Fifty, a hundred or even a thousand acres or more in size, it seeks to preserve as many natural features of the local landscape as possible. When fully developed the area has only such man-made features as are compatible with the educational uses of the area.

Usually these include an educational or interpretive building with appropriate displays and teaching aids, nature and conservation education trails, managed ponds, lakes or streams, plantations, demonstrations of soil and water conservation practices, wildlife food plantings, observation towers, weather station, habitat study areas and many other educational features.

The well-established and functioning outdoor education area or nature center has a paid staff who does the teaching and looks after the project. A small center may have only one director-teacher. A larger center may have a director and one or two trained instructors.

Educational programs may start out in the beginning with only summer programs. As interest and support in the community develops, this can graduate into an all-year-round, formalized program.

Three types of nature centers are developing in America. Administratively they are classed as follows.

Type 1: the privately-financed, owned and operated nature center; e.g. Aullwood Audubon Center, Dayton, Ohio operated by the National Audubon Society.

Type 2: the quasi-public center which is partially government tax supported but privately owned and operated; e.g. Stamford Museum and Nature Center, Stamford, Conn.

Type 3: the government-owned and operated nature center; e.g. Rock Creek Nature Center, Washington, D.C. operated by the National Park Service.

OBJECTIVES OF A NATURE CENTER

A community nature center is designed to help the people of a community pursue programs of educational, scientific, cultural and recreational value. The various goals of the nature center may be listed under four magor categories:

EDUCATIONAL

1. To increase knowledge and understanding of our natural world and man's place in it.
2. To develop an awareness, appreciation and an affection for nature.
3. To develop a desire and will, based upon understanding, to protect, safeguard from harm and use wisely the living and non-living resources of the earth important to man. These are the first steps in the development of a geobiotic ethic.

SCIENTIFIC

1. To have a natural area near a community where students may study physical features and the native fauna and flora.

2. To have an area where the ecology of natural communities can be studied.
3. To hold in perpetuity in and around urban areas some representative samples of the native landscape.
4. To help provide a natural outdoor laboratory for the stimulation of scientific curiosity, especially among young people.

CULTURAL

1. To help train persons in awareness and skills and thus to add to their capacity for enjoyment.
2. To teach good outdoor manners and conduct, thus helping to curb vandalism and juvenile delinquency.
3. To develop in young and old a sense of appreciation, respect and reverence for all living things, thus adding to man's moral character.
4. To promote better citizenship by stressing individual responsibility

RECREATIONAL

1. To promote wholesome and productive outdoor activity.
2. To help promote more active instead of passive recreation.
3. To add a new dimension to physical and mental health.
4. To show that more "quality" in outdoor recreation is worth pursuing.
5. To help make leisure time productive.

The number of nature centres and related types of environmental education facilities continues to expand at an increasing rate both in the United States and Canada. The National Audubon Society of New York publishes a Directory which in its first revision (1969) listed 356 facilities. In the second revision, published in 1971, there were 459 facilities. In the 1975 revision there were 558 facilities, including 41 for Canada, a growth of approximately 22%. Among the reasons given for the increase in the number of these facilities are the following: Concern with pollution, disappearance of open green space in and around urban areas, realization of the finite capacity of our natural resources, and growing awareness of the interrelatedness of all living things.

What is environmental education, and how is it different from either outdoor or conservation education? Swan's explanation (1969) is succinct:

"Environmental education may be conceived as being directed toward developing a citizenry that is knowledgeable about its environment and its associated problems, aware of the opportunities for citizen participation in environmental problem-solving, and motivated to take part in such problem solving. It might be said, therefore, that environmental education is concerned with developing informed attitudes of concern for environmental quality.

"Environmental education is different in that it is concerned with involving people in environmental problem solving. It makes no claims to making people naturalists. Undoubtedly many students exposed to an environmental education programme would become interested in nature, but this is a secondary benefit rather than a primary aim."

Jackson (1978) believes it is helpful to make some distinction between (a) increasing general awareness of, and concern for the environment, for which he uses the term Environmental Education and (b) following a relatively narrow, clearly defined syllabus dealing with specific aspects of Environmental Education, which he terms Environmental Studies. "Every teacher ought to be involved to some extent in the former, whilst the latter is likely to require a specialist or a team. Unfortunately, because of its traditions, most teachers in the upper school — many more than in the lower years — do not regard themselves as having a part to play in Environmental Education".

Sale and Lee (1972) claim three specific tasks for environmental education in the elementary school, (a) generating awareness of how man and his technology affect and are affected by the environment, (b) concern for re-establishing and re-creating balanced relations among all forms of life, and (c) motivation and training to solve current problems and prevent future ones.

The United States Environmental Education Act was designed to promote environmental education at all levels by providing funds for curriculum development and personnel. The Act, which became law when President Nixon signed it on October 30, 1970, provided two million dollars in start-up funds planned for future years. This has provided an impetus for significant curriculum development in environmental education on a nation-wide basis.

Sale and Lee (1972) believe that the process of helping children to become aware of their environment and its problems should begin even before formal schooling and should certainly be emphasized in the elementary school. However, are there stages in the development of environmental responsibility, just as there are stages in cognitive development and moral development? Are we concentrating our efforts in schools and field centres on the primary children, who may not be capable of rational decision-making? Stapp (1974) claims that it is imperative that schools provide youth with the knowledge and problem-skills they need to cope effectively with life-involving decisions. However, he does go on to say, in discussing a K-12 programme that some environmental encounters need not be strongly problem oriented. For example, he says, in the lower grades there should be an attempt to bring out basic awareness and appreciation for the environment. An investigation of the school site by a first grade class might expose the children to ecological principles. "Although recognition and solution of relevant problems are appropriate for lower grades, the honing of problem-solving skills is more appropriate for the upper grades".

Piaget's theory places eleven year olds in the transition stage between concrete operational and formal operational, although studies in Australia (Dale, 1969) show that sixth grade children in Australia are predominantly concrete. This has implications for environmental education in the primary school. The concrete operational child's predominant characteristic is his ability to apply logic only to concrete objects. The obvious implication for teaching is to make maximum use of concrete materials. Related to this is the need for an activity-oriented approach. Environmental problems that are readily observable provide ideal topics for study, e.g. schoolyard litter. But as the child is unable to engage in hypothetical thought, consideration of ethics and values should be underplayed (Towler and Dittmer, 1977).

Towler and Dittmer, in discussing psychological readiness and environmental education, also claim that egocentricity is characteristic of this stage. The child cannot appreciate other points of view; therefore his own experience or personal relationship with the environment should be stressed. Study should focus on the local level, as the child's concept of scale and his relationship to the world in general are not well developed. Children can learn to recite environmentally sound rules (e.g. anti-litter propositions), but in many cases will see no harm in the individual act (of littering) as "only a bit of pollution".

Another common manifestation of the child's egocentricity is the out-of-sight out-of-mind mentality. For example, concrete operational children have difficulty relating to such problems as solid and liquid waste disposal. In their view, once the toilet is flushed or the garbage picked up, there is no "problem". Approaching these issues requires field trips, in-class modelling and experiments, and constant reference to the child's role in the system.

Environmental education by its nature is closely associated with values education. This has been pointed out by many environmental educators, including Swan (1971), who feels that the root cause of the environmental crisis is not population growth, industrial growth, nor our economic and political systems but human attitudes and values which motivate human decisions. Going further, he states that "we must develop assessment techniques for determining the current state of environmental attitudes, as well as the success of our environmental education programs".

It is clear that the educator in environmental areas should not ignore the process of values clarification. Stapp (1974) claims that values clarification is of paramount importance in making rational environmental decisions every day of a person's life, and must be a basic part of every environmental education programme. Values clarification stimulates an individual to examine his behaviour by clarifying for himself his purpose, beliefs, attitudes, and other value indicators. It helps to alleviate and remove the inconsistencies that might exist in an individual's life and encourages the development of self-concept.

What is the situation with regard to evaluation in the field of environmental education?

Reference to the Encyclopedia of Education Research, 3rd edition (1960) indicated that no entries existed for environmental education, or for field studies, conservation or outdoor education. The fourth edition (1969) has a heading for "Outdoor Education", the only entry relevant to this study. Some of the early studies from which present-day concepts of outdoor education were developed were concerned with the values of summer camping experiences. However, in the Reference List, only three studies there have any reference to evaluation in the affective domain. Research into leadership programmes, curriculum development, and administrative practices in camp programmes are the common topics. Richmond and Morgan, writing in 1977, claimed that a review of the literature indicated that, prior to their study, there were only six existing large-scale baseline studies relating to environmental knowledge and attitudes of secondary students. Adby (1977) also referred to the existence of little research information on the casual relationship between fieldwork and affective learning.

The purpose of an investigation by Kostka (1976) was to locate or design a suitable environmental attitude scale instrument to test the effects of selected ongoing nature center programs on the attitudes of a sample of sixth grade visitors, and to propose any adjustments in future nature center philosophy based on these results. Two nature centers in the city area of Minneapolis, U.S.A. were selected because of their interest in the research project and their good reputation among environmental educators. Sixth graders were selected because, among other reasons, (1) they are at the top of the elementary school learning experience, (2) a certain level of reading ability was required for testing, (3) on a national scale, sixth graders represent the educational level (K-12) receiving the greatest environmental effort. In general, this research indicated that current environmental methods examined (involving one nature center visit per year and related school activities) made little impact on the environmental attitudes of sixth graders. Kostka recommended, among other things, that further research is needed to study the development of environmental attitudes in infancy and over long periods of time, and also to refine an environmental attitude scale for various age groups. He further stated that nature center program philosophy should expand from a more traditional focus on natural science themes to include the social sciences. Nature center visitors especially need help in integrating attitudes and finding outlets for actions which help environmental causes.

Hounshell and Liggett (1973) carried out a study to evaluate two aspects of environmental education for sixth grade pupils in North Carolina. These aspects were (1) knowledge about the environment and man's relationships to it and (2) attitudes toward the environment. Sixty-five items comprise the instrument, with thirty-five items measuring knowledge and thirty items measuring attitudes. An analysis of data to determine significant differences between the sub-groups of male and female and rural and urban students was carried out. In the results, the female participants had a significantly more positive attitude towards the environment than did the male participants but there was no significant difference in their knowledge about the environment. Correlation between the individual's knowledge and his positive attitudes toward the environment was extremely high. There was no significant difference in the attitudes towards the environment between urban and rural students, but there was a significant difference on the knowledge sub-test. The overall mean score on the knowledge sub-test was low (14.3 out of a possible 35) and the overall mean attitude score was only slightly higher (16.35 out of a possible 30).

Cohen (1973) also carried out a study to clarify the relationship between environmental attitude and information, this with a group of high school students. He found a relationship did exist, those with more information forming different attitudes and also being more willing to express them.

Hounshell and Liggett concluded that one viable approach to creating constructive environmental attitudes appears to be providing knowledge about man's environment and his role in the environment to the student.

Pettus (1976), however, claims that there is a level at which more formal education and environmental information ceases to cause people to be more favourable toward restrictive measures for improving environmental quality, and in some cases may be inversely related. He further states that even when people are aware of the facts and know what behaviour will bring about and maintain the desired conditions, elements like economics and convenience, as well as many other factors, will continue to dictate their responses.

Fleetwood and Hounshell (1976) concluded from their study with high school biology students that instruments can be developed to measure both the cognitive and affective outcomes of instruction in environmental education. However, item analysis of student responses to the Environmental Attitude Inventory demonstrated that the instrument is capable of discriminating between individuals, but the authors were not convinced that the responses to the instrument reflected the real behaviour of the individual.

An instrument was developed by Horvat and Voelker (1976) to assess (1) the "environmental responsibility" of fifth and eighth grade students and (2) their perceptions of environmental problems and the people who solve these problems. Thirty-seven items in standard Likert agree-disagree format were written and judged by a six-member panel of environmental educators. Panel members scored each item on "environmental responsibility" according to its ability to present some environmentally responsible action, behaviour, or attitude. In addition to the prime criteria of "environmental responsibility", four characteristics were used to analyse each item:

1. item scalability (do response positions discriminate among respondents?)
2. biserial correlation with total test score (response made to each item should correlate highly with total test score)
3. item comprehension for children in grades five through eight
4. each item should have a mid-range mean score, two to four on a five-point scale, so the overall test has some capability of measuring directional change for heterogeneous groups.

Twenty-five items were selected after item analysis on a pilot test. Three examples of items used are:

1. The cause of many problems in the world to-day is too many people.
2. Soda pop should be sold only in bottles that can be used again, not in cans.
3. We have enough parks and forests now for wild animals to live in.

For the test, independent variables of grade, community, SES, IQ and sex were used. In the results, IQ and grade were the most dominant, predictable "influences" on upper elementary school children's environmental responsibility. Almost without exception, the older and higher IQ children were more environmentally responsible. Surprisingly the children's local environments (generalized as it was into three classes: urban, suburban, rural) were only important for how students perceived nature and natural areas. Better home environments — commonly associated with high SES families — also seemed beneficial in developing a child's sense of responsibility towards the environment.

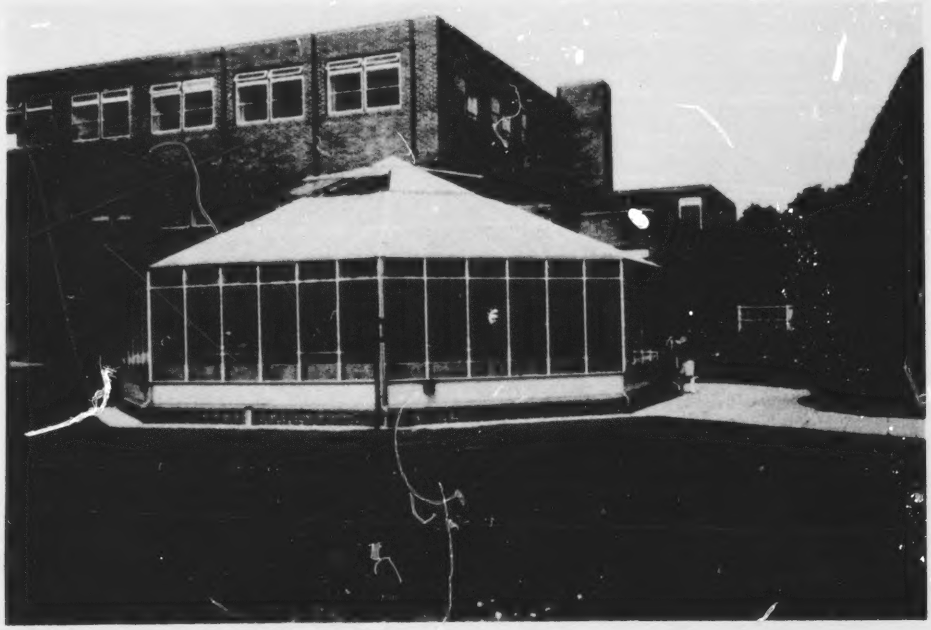
In the November 1978 issue of the Australian Science Teachers Journal a survey of environmental knowledge and attitudes of Year Ten students in Australia in 1974 by Eyers was reported. The general knowledge displayed by the Year 10 students was low, for in only 10 of the 29 items did 50% or more of them identify the correct response. In the beliefs section, things were 'better' in that there was a moderately high level of agreement with responses made by the panel of 'experts'. In six of the nine relevant items, over 50% of the students concurred with the panel's viewpoint. The final item of the 30 asked in the knowledge section asked the students to identify the source of most of their environmental knowledge among four alternatives, viz. general school education, special courses at school, private reading and the media, and discussion with friends and others. Only 4.2% claimed that special courses were the major source of their knowledge about the environment, and only 35% listed general school courses. In other words, about 60% of these Australian (174 schools from all States) Year 10 students believed that most of their environmental knowledge came from non-school sources. Analysis of responses subsequently showed that the 'private reading and media' students knew significantly more about the knowledge items listed. With this fact in mind, Eyers asks the question, "If you had a million dollars to spend on an environmental education programme which was to lead to environmentally supportive behaviour, would you give the money to the schools?".

CONCLUSION

It is clear from the literature that evaluation in the field of environmental education is still in its infancy, and even less work has been done to measure the effectiveness of programmes in field studies centres and community nature centers.

It is also clear that more information is needed on the abilities of children to cope with "environmental responsibility" and their "readiness" to deal with decision-making and the solving of environmental problems. Until that is known, vast amounts of finance, time and energy may be expended on the primary child, the main customer of the field studies centres, while teenagers and adults, closer to decision-making, may be neglected.

The ancestral home, now a Field Studies Council Centre in Yorkshire, England.



An ecology unit in a private school out of London.

CHAPTER 2 — FIELD STUDIES CENTRES IN THE U.K. AND U.S.A.

2.1 THE FIELD STUDIES COUNCIL OF GREAT BRITAIN:

The Council for the Promotion of Field Studies (which later changed to its present title) was founded in 1943 and had opened its first four field centres by the end of 1947. Later centres have been acquired at intervals in response to the growing demand for places, and by the end of 1977 they totalled ten. Field centres were first envisaged primarily as residential establishments providing accommodation and modest technical facilities for amateur naturalists and university field classes. The admission of school parties on courses organized by the wardens and staff of the field centres led to a change in the whole conception of their purpose, and has been largely responsible for the successful development of the Council's work over the past thirty years.

The field centres have been chosen partly for the suitability of their premises, but mainly for the richness and variety of the geographical and ecological features of the areas in which they lie. At the present time about 75 per cent of the visitors to all the field centres are sixth-form biology and geography students and a further 10% biologists from training colleges and universities, with about 15 per cent members of the general public, all on residential courses mostly of one week's duration. The majority of the school pupils are attending courses run by the staff of the centres, but a significant and slowly increasing proportion operate independently under the guidance of their own staff.

Each centre is staffed on the academic side by a warden and two or three assistants, all graduates whose qualifications between them cover the principal fields of teaching. With an intake of fifty to sixty students on residential courses every week for 8 months of the year, the academic staff at each centre find their time largely taken up by routine field teaching duties. Nevertheless, they are encouraged to engage in research on topics more or less closely related to their teaching work. The results of such research are published from time to time in the Council's own Journal, Field Studies, which also takes papers relevant to the Centre's working areas from outside contributors.

The individual centres are more or less autonomous in the planning of their programmes, in devising the subject-content and curriculum of their courses, and in the enrolment of visitors. The courses are run in every week between the beginning of March and the end of October, programmes with a calendar of organized courses being issued each November for the following season. Apart from the routine sixth-form courses in geography and biology and less frequent ones in other subjects at the same level, each centre includes a number of more advanced and specialized courses (sometimes run with the help of outside tutors); increasing attention is being paid to the provision of courses in field methods for teachers.

The Field Studies Council is independent financially and administratively, and meets practically all its running and capital costs out of the fees paid by visitors. Nevertheless, the Council is still indirectly grant-aided in that most school pupils and teachers attending the centres are eligible for some financial assistance from their Local Education Authorities.

At the present time the Council occupies a special position among the organizations which run field study centres, by virtue of its longer experience, its highly qualified teaching staff with their opportunities for original research, and its close links with universities and research institutions. The Council's independence, moreover, has made it possible to act on a fundamental conviction that teaching in the field must not be tied to any formal academic syllabus, but should be free to draw both its data and its synthesis from the whole landscape.

2.2 THE FIELD STUDIES CENTRE IN HERTFORDSHIRE (U.K.)

A visit to Hertfordshire in 1978 was aimed at looking for the establishment of a field centre pattern in a county recommended for its progress in environmental education (pers. comm. from a member of the British Council).

This county has twelve centres, the first one being set up in 1962, but the development has been an ad hoc one with selection not based on finding an ideal environment, but governed by the availability of already existing buildings. This latter course was due to financial constraints, and if the area around the old home or closed school school was generally good, and the schools in the division had expressed a need, a staffed field studies centre was set up.

Today all twelve centres are fully booked, and a need exists in two divisions of the county still without centres for primary schools (the twelve established centres include four primary, six secondary and two K-12 centres). Inservice of teachers is part of the role of each centre staff - a preparatory one-day course is held at each centre at the beginning of the school year. Teachers with classes booked in at the centre attend the course and then return to their schools to devise a programme which is sent back to the centre.

Staff in field centres, seconded from the schools, receive no formal training; the centres are controlled by the Local Education Authority with an Adviser in Environmental Education. The centres to date are not used by the general community for any type of outdoor education.

Hudnall Park, near Berkhamsted, is a residential centre for secondary students who stay for four days, each student paying £14.40; the visit is also subsidised by the County. The following breakdown of staff for such a centre may be of interest:

1. Caretaker/chef and wife — resident.
2. Warden — on duty until 5.30 p.m.
3. Assistant warden who visits primary schools and helps with visiting secondary schools three days a week.
4. Secretary — full-time.
5. Gardener — part-time, part of a team which works for all schools in the county.
6. Four part-time ladies who come in at odd times to help with cooking and cleaning.

2.3 NOTTING DALE URBAN STUDIES CENTRE (LONDON)

A centre with a different emphasis, a different administration, and a different clientele is the inner city centre at Notting Dale. The moving idea in the concept of urban studies centres, as outlined by Chris Webb, the warden, (centre visited 1978), was that they should be 'enabling places' where people in both formal and informal ways could become involved in questions

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Reference: Sinker, C.A. (1967). The role of field centres in ecological teaching. In Lambert, J.M. (ed.) The Teaching of Ecology. British Ecological Society Symposium, Vol. No. 7, Blackwell, Oxford.

In the grassy field beside the centre, students at Hudnall Park, England, set mammal traps.

The custom-built centre - Tilden, San Francisco.

of quality of life and how to impinge on the processes of planning and politics. In this way the people that actually live in cities and towns could play the major role in shaping their environment and choosing priorities from the limited shopping list.

The Centre now seems to work in three main dimensions, all of which overlap and sustain the others. Firstly, it is a resource centre in an area which has few facilities of this kind. The Centre has an impressive array of hardware all of which is available to local groups and school groups.

Secondly, the Centre caters for a wide range of school groups, university students, trainee teachers, and planners. Although there is a wide range of local resources (slides, maps, planning briefs, history archives, etc.), the main emphasis is on groups generating their own research and learning as they use their own organised perceptions upon the urban scene.

Many school groups are from social studies and geography departments, but the approach of urban investigations must surely be eclectic. All kinds of perspectives shift and define; the historical one is important, but economics, politics, sociology, architecture, design, all contribute in an inter-dependent fashion. There are often no right answers to the questions of the city scene but all such questions are fundamentally radical in challenging the status-quo.

The third dimension of the Centre's operations is its contact with the tenants groups, residents' associations, and many other groups in the area. Sometimes schoolchildren are involved here in helping research an area of concern, for example, over recreational facilities, and the class findings are used by the adult group in its fight for better amenities. Often the Centre merely provides the hardware for a momentum already achieved, but there are other occasions when the staff involves itself with local groups in wholesale collaborative exercises. These can be the formulating, printing, delivery, collection and analysis of questionnaires on a particular estate, the results being used by the Tenants' Association to help remedy defects in their area and to pressure the Council from a position of strength. Or the Centre staff may play a part in a planning enquiry, acting as a witness and helping to produce materials for evidence, etc.

The Notting Dale Urban Studies Centre is privately funded — Harrow Great Public School finances it through a trust, the whole idea originally being that of the head of the Economics Department at Harrow.

2.4 MINNESOTA AND IOWA (UNITED STATES OF AMERICA)

The most impressive fact to discover about field centres in both Minnesota and Iowa is their development by not only education authorities but by Town Councils, County Boards, private individuals, and authorities such as the Fisheries, Forestry Service, Audubon and National Parks. For example, Woodlake Nature Center of 150 acres is managed by the city of Richfield through its Parks and Recreation Division. It is open seven days a week and caters for both schools and the general public. The staff includes four full-time naturalists, part-time work-study students, volunteer naturalists working for College grades, secretarial staff and two maintenance staff. In Minneapolis alone there would be 9-12 nature centers of this type, and further afield, in California, San Francisco Bay has more than two dozen nature centres. The 1970 National Evironmental Education Act must be at least partly responsible for this proliferation of centres, but the American people as a whole are alerted to a possible environmental crisis and so display a greater awareness than other countries.

How do the "nature centers" of Iowa compare with the school — oriented field studies centres of New South Wales and Queensland? Firstly, their establishment and continued support by both the State government and the local community (as in Minnesota) is a feature which must contribute to agreater impact than that found here. The 1970 National Environmental Education Act is a sign that those in higher places recognise the urgency of the situation — namely to educate the total population to a point not only of awareness but ability to make meaningful decisions. The work of the County Conservation Boards is another indication of support at the governmental level. Local community support is evident in such bodies as the Community Advisory Council at Hartman Reserve, Cedar Falls, and the large supportive group of board members at Indian Creek Nature Center, Cedar Rapids. As Mary Duritsa, naturalist from Hartman said, "The people here wanted this land and this center — the demand was there".

Secondly, staff and facilities are available to all members of the community, week-ends and vacation time included. Programmes are provided for both school and adult groups.

The work of the Youth Conservation Corps, although geared to areas other than nature centers, must be mentioned as a worthwhile concept. The young people are paid by the government to work on improvements and renovations for the centers, but ten hours each week is allocated to classes in environmental education.

In Minnesota, environmental education has progressed greatly in the last ten years, and everyone is trying to play a part in it — every agency is producing its own staff and materials, but, there is no co-ordination in the State, and confusion exists for teachers who do not know which materials to choose. John Miller, Environmental Education Consultant for the Department of Education, Minnesota, is concerned about the situation, but his proposals for a solution to date have not been accepted by the Education Department.

Staff in American centres vary in background; some are trained naturalists, some are trained teachers. Up to the present, training for staff in environmental centres has not been adequate — only in the last 2-3 years have Colleges initiated courses to train naturalists for the specific task of staffing a field studies centres.

2.5 THE OUTDOOR EDUCATION NETWORK IN SAN FRANCISCO BAY

It would be misleading to present a picture of the American "community nature center" without pointing out that it is only one type of facility operating in the area of environmental education. As a case study one could take the area around San Francisco Bay and inspect the variety of educational facilities available to both students and community alike.

2.51 THE ALEXANDER LINDSAY JUNIOR MUSEUM at Walnut Creek is not strictly speaking a field studies centre, but a staffed facility under the authority of the City of Walnut Creek (part of Leisure Services Department), aimed at the dissemination of natural history information via live exhibits, animal loans, a library, bookstore, and guided tours. The programme is operated by three full-time staff and five hundred volunteers (all taking part in a volunteer education programme)!

2.52 POINT REYES NATIONAL SEASHORE is a national park which has within its boundaries an Environmental Education Center. Prior to its establishment in 1973, the Park Service used some structured programmes e.g. the National Environmental Education Development (NEED) programme, specifically designed for park use, but this was not successful. The Park Superintendent believed a generalized scheme is not necessarily a successful adaptation in every park; Park Rangers and Superintendents tended to resent the structured programme which allowed no flexibility for the type of Park or the background of the Service staff.

With pressure from the local schools, a co-operative venture developed — an abandoned ranch in Point Reyes was taken over, and a co-operative association drawn in to handle the economic side — the Coastal Parks Association. So the center is legally an operation of the Coastal Parks Association, but the only staff member, the manager, Paul Mellion, is Parks Service personnel, and all management of land and buildings is under the control of the Point Reyes National Park Service. The center is self sufficient (apart from the manager's salary) — the children pay $2 a night, bring their own food, and sleep on the floor in timber cabins. Each programme is a co-operative venture between the center and the school; teacher workshops are held twice a year over a full week-end. The children's week-long stay is a total environmental encounter — children tend the gardens and the composts, learn to depend on solar energy for cooking and heating, and walk every day — walk to the beach and pools, to the ridge of pines, along the coastal scrub, through the grasslands, up the stream and down to the pond. On the trails, and living in the center, Paul Mellion's objective is to develop an increased awareness to lead to better decision-making.

2.53 GOLDEN GATE NATIONAL RECREATION AREA

In 1968 the National Parks Service in California, conscious of the need to preserve their parks, gave priority to an education programme which ensures to-day that in every elementary school at least, environmental educational is as much a part of the Californian curriculum as any other subject. The Parks have sponsored an Environmental Living Programme — history is being taught by role playing in 32 sites throughout California — 3 sites are in this particular park, and most other sites are in State and National Parks.

For example, at Fort Point, a National Historic Site at the base of the Golden Gate Bridge, the Environmental Education Co-ordinator supervises children visiting the fort to spend one night as a soldier at the turn of the century. Cooking, sleeping, guard duty, a prison term — all conform to the historic pattern.

Another Environmental Living Programme takes place aboard one of the historic ships at the Hyde Street Pier. Fourth-sixth graders can relive the experiences of a codfisherman in an overnight educational programme.

2.54 RICHARDSON BAY WILDLIFE SANCTUARY is an area of 13 acres and here the National Audubon Society supports the Whittell Education Center, an urban center, day visits only, with programmes run by staff and volunteers on bay shore ecology, bird studies, pond and marsh ecology, grasslands, coastal brush and forest trails. This center is urban in the sense that it is a small oasis within a heavily built-up area, and as such, has a vital role to play in the community.

2.55 THE ROTARY NATURAL SCIENCE CENTER is unique since it is a combination of a wildlife refuge and a nature center in the heart of a city — downtown Oakland. Unfortunately the design of both the outdoor cages and the building itself are an example of what happens when an architect in New York, divorced from the reality of the site, the proposed programmes, the clients and the staff, is asked to do the job of designing a suitable center. Because of its position, this center has great potential, and the full efforts of a dynamic director and some extra finance are needed to lift the quality of the exhibits and the programmes.

2.56 SAN FRANCISCO BAY NATIONAL WILDLIFE REFUGE controlled by the U.S. Fish and Wildlife Service, has a newly completed education center at Alviso, the first environmental education center sponsored by Fish and Wildlife in the whole United States. The center, built on the San Francisco Bay marshes, includes such advantages as — two laboratory-classrooms, an observation tower, a large auditorium, a solar energy system, and a unique rustic design. However, this is yet another case of lack of consultation between the architect and someone conversant with children and the needs of an environmental education programme — disappointments include lack of wall space for exhibits, no space for a library, no plans for an entrance porch, etc.

2.57 MARINE ECOLOGICAL INSTITUTE

In 1970 a private, non-profit group set up this educational enterprise aimed at exposing school and college students and adult groups to a Discovery Voyage in the Bay. Students take a four-hour voyage on South San Francisco Bay aboard the Institute's 85 foot research vessel, Inland Seas. The students act as "assistant oceanographers" as they trawl for fish, plankton and invertebrates, and examine the geology and chemistry of the Bay through water and sediment samples. Other activities include a marshland expedition, opencoast/tidepool exploration, a three-day San Joaquin Delta Trip and a summer teacher workshop (for credit).

2.58 BAYLANDS NATURE INTERPRETIVE CENTER is a center administered and supported by the City of Palo Alto, set in the marshes on the bayward side of Bayshore Freeway in Palo Alto. This center will be discussed in detail in Chapter 16 since in many respects it approaches the ideal center and answers, in theory at least, the question as to how we should be planning here in Australia.

2.6 THE CUSTOM-BUILT CENTER — TILDEN (SAN FRANCISCO)

The East Bay Regional Park District supports an Environmental Education Center in Tilden Regional Park, Berkeley. Chris Nelson, Chief of Parks and Interpretation, planned the center with care, and opened it in October, 1974. Following is a comment in an Environmental Impact Report by the Investigator, Dr. Seymour M. Gold, Associate Professor of Environmental Planning at the University of California.

> "Perhaps no single facility in an urban area could more support, enhance, and reinforce man's sense of stewardship for the environment and future generations than this type of building and the programs it can offer. Without qualification, this building, as proposed, would accomplish the spirit and intent of the California Environmental Quality Act and should have a significant impact in motivating others to understand and help support the meaning of this act. I believe this building and the environmental education programs it will support can have a national impact because of the innovative nature of both. What is done in California and the Bay Area often sets a national example of environmental quality ..."

Why is this center so innovative, so likely to set a national example of environmental quality?

Firstly, the building was designed to serve the programmes, and not, as is so often the case, vice versa. For example, the exhibit hall is designed without glass fronts, and without windows (to avoid distractions); the auditorium wall is designed to support a first-class display to cater for the waiting time of the early visitor; a recessed well with carpeted tiered benches faces a fireplace, all the walls shingled, to cater for the visitor's comfort as he listens to the introductory talk by the naturalist. The entrance, a rotunda with skylights and a high ceiling, gives the visitor a feeling he is coming to somewhere different and somewhere special. The receptionist is positioned so she can see every entrance and exit and function in the building — a deterrent to vandalism. All functions are broken up — in the rotunda is a curiosity corner, a notice board about the regional parks, an environmental corner with information about other environmental organizations; storage is in a separate room; a large auditorium has a raised dais at one end, a puppet theatre in the corner, the opposite end wall curved and surfaced for a multi-slide show. A noctural animal hall, still in the planning stage, will have a static information display and living exhibits. This center was designed not only for school groups but the general public as well — it had to be interpretive as well as educational. Most educational programmes occur outdoors in the Tilden Nature Area, but activities extend also to wilderness hikes and supermarket tours.

The staff includes a receptionist, secretary, caretaker, and five naturalists. The part of the building for the staff had staff needs in mind — a satisfied and comfortable staff works well, Chris Nelson added.

A security residence at the back deters vandalism; a solar greenhouse is built adjacent to the staff offices; the center itself has much natural material in its construction — shingles are widely used — and the whole design is aesthetically pleasing. In 1975 the building alone cost $500,000, all Parks money.

Chris Nelson believes that this center, non-residential, and catering for short visits, has as its main objective the development of awareness and appreciation rather than knowledge and understanding, although it is the author's opinion that the center itself, and its programmes, must surely lead not only to a greater awareness of the environment, but knowledge and a sense of responsibility too.

CHAPTER 3 — THE AUSTRALIAN SITUATION:

The rapid growth of environmental concern during the seventies has already led to a concern among individuals and groups about the need to collect and disseminate data on field studies centres in Australia. Not only is this a need for information along the lines of a resource inventory, but there is a concern about trends within the education system and the role to be played by the centres in achieving desirable educational objectives.

For this reason, a number of questions are posed as the backbone of this study, and the objective is two-fold:

1. to compile a resource inventory pertaining to field studies centres in Australia
2. to attempt to answer such questions as the following —
   - (i) are the field studies centres showing a pattern of development that is consistent with a wise use of resources?
   - (ii) are the field studies centres staffed by N.S.W. education officers achieving their objectives as they relate to visiting school children?
   - (iii) if proposals to establish field studies centres in National Parks continue to be put forward, it is essential to ask
     - (a) is the concept of a field studies centre as a worthwhile educational experience a valid one?
     - (b) are natural areas being sampled wisely by the total field studies network in any one state?
     - (c) is the present network fulfilling educational needs? how far does the expansion need to go? do field studies centres need to be in National Parks?

Therefore it appears that the overall aim of this study is to identify those places in each State of Australia which show potential as vehicles for the development and dissemination of environmental education. At this point some further clarification of terms is necessary.

3.1 ENVIRONMENTAL EDUCATION:

From the Belgrade Charter (1975) the goal of environmental education is:

To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.

The objectives of environmental education are:

1. Awareness
2. Knowledge
3. Attitudes
4. Skills
5. Evaluation ability
6. Participation

ENVIRONMENTAL EDUCATION PROGRAMMES:

From the Belgrade Charter (1975) the guiding principles of environmental education programmes are:—

1. Environmental education should consider the environment in its totality — natural and manmade, ecological, political, economic, technological, social, legislative, cultural and aesthetic.
2. Environmental education should be a continuous life-long process, both in-school and out-of-school.
3. Environmental education should be interdisciplinary in its approach.
4. Environmental education should emphasise active participation in preventing and solving environmental problems.
5. Environmental education should examine major environmental issues from a world point of view, while paying due regard to regional differences.
6. Environmental education should focus on current and future environmental situations.
7. Environmental education should examine all development and growth from an environmental perspective.
8. Environmental education should promote the value and necessity of local, national and international co-operation in the solution of environmental problems.

It follows then, that field studies per se form only one input to the total experience in environmental education.

Field studies include the pursuit of fieldwork and research in every branch of knowledge whose essential subject matter is out of doors, and includes studies in both general and specialised aspects of botany, zoology, geology, geography, natural history, local history, archaeology, and the landscape. In other words, **field studies** require observation and experimental work in any part of the environment, and often involve further work in the laboratory with collected specimens, or maps, or laboratory equipment.

Environmental studies, on the other hand, is taken in this paper to mean the use of the environment in providing integrated and meaningful studies in curricula at any level.

In summary then:

Environmental studies is an integrated approach to curriculum based on a study of the environment.

Field studies involve observation and experimental work in all aspects of the environment.

Environmental education aims at increasing awareness of and concern for the environment, and field studies must be seen as an essential contributor. Environmental education should also be interdisciplinary in its approach.

3.2 EDUCATIONAL OBJECTIVES

3.21 Environmental Education

(i) The Belgrade Charter:

"To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively towards solutions of current problems and the prevention of new ones."

(ii) International Union for Conservation of Nature
at their Conference in Nevada, 1970.

"Environmental Education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his bio-physical surroundings.

"Environmental education also entails practice in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality.

(iii) Dean B. Bennett

"It is clear to-day that environmental education, as it is called, is directed towards the development of attitudes and behavioural skills in the area of environmental decision-making and problem solving." (1974, P.113)

Subgoals (Bennett)

1. (affective subgoal)

To help individuals acquire strong feelings fundamental to developing a concern for the environment and a motivation to participate in activities for maintaining and improving the quality of the total environment.

2. (cognitive subgoal)

To help individuals acquire basic understanding of the total natural and man-made environment, their relationship with this environment, and common environmental problems.

3. (behavioural — skill subgoal)

To help individuals develop the necessary thinking and behavioural skills for the prevention of environmental degradation, the correction of environmental abuses, and the alteration and use of natural resources to enhance the function and quality of the environment to meet ecological including human needs.

3.22 PRIMARY EDUCATION

The central aim of education is to guide individual development in the context of society through recognisable stages of development towards perceptive understanding, mature judgment, responsible self-direction and moral autonomy.

Such development is facilitated by educational experiences which ensure the necessary acquisition of knowledge, skills and attitudes at appropriate personal levels at different stages of life.

3.23 POLICY FOR INVESTIGATING SCIENCE K-6

Science education for children consists of the gathering of information and the interpretation, communication and testing of findings, leading children towards the development of skills, attitudes, knowledge and understanding concerning themselves and their total environment.

3.24 A PROGRAMME IN ENVIRONMENTAL EDUCATION FOR A N.S.W. PUBLIC SCHOOL (MT. KU-RING-GAI)

General aims

1. to develop an awareness of the absolute dependence upon nature and what is happening in the environment.

2. to provide varied environmental **encounters** which will lead to a comparison with other locations.
3. to provide an insight into **how nature works** by bringing the following to the attention of the children: diversity, adaptation, dependence, interdependence, food chains.

For primary classes

4. to show the dependence of man-made environments upon the landforms and natural systems which not only pre-existed the arrival of European Man but also continues to operate in some amended form to the present time;
5. to point up the positive and negative values in the environment which have followed European Man's invasion, and to suggest ways and means of benefiting from the good whilst eliminating the undesirable;
6. to stimulate enquiry into resource management by asking Who? What? How? Why?
7. to encourage the children to form valid and realistic value judgments in respect of the above.

3.25 THE FIELD STUDIES CENTRES IN N.S.W.

The teachers-in-charge of the Department of Education centres in New South Wales issued a statement in September, 1979, and the following information is taken from that statement.

The department of Education Field Studies Centres in New South Wales act as agents of reference for schools on environmental education. These regionally based Centres have been established in response to a desire by various groups within the community for children to be better equipped with the knowledge, skills and attitudes necessary to make decisions on issues concerning environmental quality.

THE ROLE OF FIELD STUDIES CENTRES:

Field Studies Centres provide departmental schools with the unique opportunity to further enhance their educational provision by providing personnel who:

1. accept school groups for field work activities within the Field Studies Centre and its environs.
2. assist teachers to participate with their classes in acquiring field techniques which can then be applied to their local environment.
3. visit schools to assist in planning and implementing environmentally-orientated school programmes.
4. travel to a school prior to a class visiting the Centre, to plan and organise the proposed visit. Where such personal contact is impossible, discussions may take the form of a telephone call or in writing.
5. may assist school groups in field studies at other sites.

6. assist in the development of school nature areas.
7. provide In-Service training in environmental education for teachers.
8. produce and supply resource material on environmental education.
9. promote an active, pupil oriented approach to environmental education, emphasising processes at work within the environment.

3.3 THE FIELD STUDIES CENTRE

The criteria for a field studies centre on which this study is based are taken from Piesse's Coolart paper:

1. a suitable building or complex of buildings furnished and equipped to meet the needs of the users and the centre's programme.
2. proximity to an area of accessible environmental resources providing a contrast of landscapes and land uses and offering a diversity of natural, semi-natural and man-made sites for purposes of environmental studies.
3. a clearly-defined conservation and educational policy or plan aimed at persons both within the formal education system and outside it.
4. leadership by an autonomous professional warden with full responsibility for initiating, developing and running the educational and any on-going research programmes in a creative and flexible way.

There are some who would argue that "field studies" can operate in a number of facilities not called field studies centres, and which appear to have the four criteria above, for example Taronga Zoo, Sydney, or a farm with an educational programme. Within the classification to be outlined below, such facilities have not been included under the term "field studies centre", and a comment from Graham Morris, Education Officer, Melbourne Zoo Education Service, is of interest in this connection (pers. comm. 1979).

"I classify the Zoo very much as a secondary form of nature. Similarly with the Botanic Gardens — it is a sort of an encapsulated form of nature.

"I would like teachers to think in terms of so-called secondary forms before they think about going out into primary forms, which are the real, raw stuff.

"Finally, I don't think that the Zoo has much to offer directly to teachers of environmental education, nor do I think that the Museums or Art Galleries have much to do directly with environmental education. The Zoo is only a secondarily removed natural type of resource."

It is clear, then, that the essential and critical criterion for a strict classification as a "field studies centre" rests on criterion (2) above, but also on the type of educational programme being offered by the staff.

3.4 CLASSIFICATION OF FIELD STUDIES CENTRES:

facility promoting one or
more aspects of field studies
or environmental education

Field studies centres
(according to working
definition)
Arbury Park Outdoor School
Wirrimbirra F.S.C.
Jindabyne Sport & Recreation
Centre

additional (secondary)
educational facilities
which fulfil an environmental
education role in
one area or another
e.g. Museum
Taronga Zoo
Dubbo Zoo

But even within the facilities which fulfil the criteria of the working definition, further classification is possible, both on the type of administration under which the centre operates, and also on the type of educational programme being offered.

3.41 CLASSIFICATION OF CENTRES ACCORDING TO ADMINISTRATION:

A. Centres staffed by Education Department personnel.
B. Centres administered by Tertiary Institutions.
C. Centres administered by private bodies or private individuals (educational programmes provided e.g. Yarrahapinni).
D. Centres administered by private bodies or private individuals (e.g. conference centres — no educational programmes provided, e.g. Y.H.A. centres, Vision Valley Centre in Sydney).
N.B. This group does not qualify as a field studies centre according to the working definition.
E. Centres administered by the Department of Sport and Recreation, or by other Government Departments.
F. Centres controlled by individual schools
  (a) Government e.g. Bumberry (N.S.W.), Para Wirra (S.A.)
  (b) Private e.g. Camp Knox (N.S.W.), Timbertop (Vic.)

3.42 CLASSIFICATION OF CENTRES ACCORDING TO PROGRAMME:

It is here proposed that centres may be classified according to the kind of programme they offer, and to what extent that programme functions to promote the objectives of environmental education.

Grade 4	programmes and/or activities provide an experience, mainly sensory and aesthetic, in natural surroundings e.g. rangers in National Parks operating from a Visitors' Centre.
Grade 3	programmes and/or activities are concerned with academic or interest studies of biological phenomena or landscape e.g. marine studies on a rock platform, a creek as an ecosystem, animal behaviour in a Zoo, the strata displayed in a local quarry. The centres administered by tertiary institutions fit in here.
Grade 2	programmes and activities usually combine those aspects covered in Grades 3 and 4; they contribute not only to knowledge of the environment but encourage an awareness of and a concern for the environment. Education Department centres such as Awabakal fit in here.
Grade 1	programmes which adhere closely to the guiding principles of environmental education laid down by the Belgrade Charter.

3.43 CLASSIFICATION OF CENTRES ACCORDING TO STAFFING:

A. Permanent full-time staff (Arbury Park, Wirrimbirra)
B. Permanent part-time staff (Para Wirra, Ravensdale)
C. Staff available only when site is to be used e.g. YHA sites.
D. Permanent non-teaching manager.

CHAPTER 4 — FIELD STUDY CENTRES IN QUEENSLAND:

Queensland is one of the few Australian states with a policy statement on environmental education for Departmental schools. This statement was issued in 1976 and endorsed by the Director General.

The existence of this policy must account in part for the systematic development of a field study centre network by the Queensland Department of Education. During the seventies plans were made to establish two centres in each educational region, with a mobile centre in each of the western regions, a total of sixteen centres. At the beginning of 1980, thirteen centres (including one mobile) were functional, with plans for four fixed centres and a second mobile being held in readiness until finance is available. Incidentally, it should be pointed out that Queensland Departmental centres prefer the designation 'Field Study Centre' rather than 'Field Studies Centre'.

4.1 ENVIRONMENTAL EDUCATION IN QUEENSLAND SCHOOLS:

In the last five years there has been an upsurge of interest in environmental issues and hence a focus on Environmental Education.

Within the Department of Education three main sections became involved in this area:—

Agricultural Project Club Branch through use of school grounds, resource usage projects, habitat studies and the development of field studies centres.
Physical Education Branch with interest in school camping, adventure pursuits, social programmes and some emphasis on environmental experiences.
Curriculum Branch with a focus on the development of resources in Environmental Education including the Pilot Environmental Education Project, the Environmental Advisory Team, and the Rain Forest Ecology Programme.

Rather than having these three branches working separately, which would have led to overlapping and waste of effort, the Co-ordinating Committee on Environmental Education was set up as a standing committee to co-ordinate activities within the Department and to be responsible to the Director-General of Education on all matters pertaining to environmental education.

In setting down guidelines for environmental education in Queensland schools, Department aims to:-

introduce the pupil to his local cultural and natural environments both past and present, and help him to realise that he is part of them;
develop in pupils an understanding of how man is using and mis-using his resources;
provide an opportunity for pupils to develop social and physical skills through adventure and challenge;
assist pupils to develop and review attitudes, values and sensitivities conducive to concern for and wise use of the environment; and
assist pupils to develop a realisation that the solution of environmental problems often lies in group and political action.

Within this framework the Department encourages help from all bodies who are interested in environmental education. Private schools and organizations have the use of Department Field Studies Centre facilities. Departmental staff have assisted these bodies on numerous occasions and will continue to do so.

4.2 FIELD STUDY CENTRES:

The development of a network of Field Study Centres in Queensland has been promoted by the urgent educational requirements in this field. Education Department officers responded to a number of Australian and overseas reports which suggested that Field Studies Centres are essential elements in the education system.

Realising the necessity for such centres, the Queensland Department of Education has established centres in natural, man-modified and man-made environments.

The main purposes of the Centres are:—

to provide a learning base for students visiting the area both on a day and overnight basis;

as a teaching resource centre concentrating materials and aids to help visiting teachers and providing expertise on local issues through the centre's permanent staff;

as a learning centre for local schools supplying the resource back-up for local study of the surrounding area. The centres work in close collaboration with schools, suggesting less obvious contacts and sources for first hand investigations, building up a survey over the years of the general locality using records of investigations carried out through the Centre and independent studies commissioned by other authorities;

as a centre through which information about the environment might flow not only to school children but also to the adult population, and also as a venue for community forums where local voluntary organisations might hold meetings; and

as an in-service training facility which could meet the need for introductory and practical courses in environmental education.

The Queensland reports stress that the Centres are not intended to be the total field experience for children but rather an integral part of environmental education in schools. Field studies include both urban and rural venues, experience in a wide range of habitat types, demonstration areas for individual impact and conservation management and areas of aesthetic, social and historical significance.

The list below shows the centres already in operation and venues held for future development.

FIELD STUDY CENTRES [illegible] QUEENSLAND

BRISBANE SOUTH EDUCATION REGION

1. Jacob's Well, Beenleigh (established, staffed).
2. Numinbah (established and staffed in 1978, classes accepted from May 1978).

BRISBANE NORTH EDUCATION REGION

3. Fortitude Valley (established, staffed).
4. Sunday Creek (established and staffed in 1978).
5. Bunyaville (established, staffed).

A centre on Forestry Commission Land, Bunyaville State Forest in Queensland.

Jacob's Well Field Study Centre, Queensland.

BRISBANE WEST EDUCATION REGION

6. Stanley River (established, staffed).
   N.B. Closed school being held at Templin; will open with staff when finance is available.

DARLING DOWNS EDUCATION REGION

7. Amaroo (established and staffed).
   Alternative site at Deongwar, serviced by staff from Amaroo.
8. Koorboora, two sites — Cement Mills and Greenup. Staffed in 1978 and taking visits after May 1978.

SOUTH WESTERN REGION

9. Columboola (established and staffed).

WIDE BAY EDUCATION REGION

10. Mary River (established and staffed).
    Two alternative sites, both at Goomeri, Ringtail Centre and Woondum Centre, both serviced by the staff from Mary River.
    N.B. No second centre in this region as yet, but plans are to place one near Bundaberg.

CENTRAL EDUCATION REGION

11. Boyne Island (established and staffed).
    Alternative site at Coominglah, serviced by staff from Boyne Island.
    N.B. Second centre planned for opening at Balnagowan, near Mackay when finance is available.

NORTHERN EDUCATION REGION

12. Townsville Environmental Education Centre (established and staffed).
    Two alternative sites, Inkerman and Vincent State School (urban centre), both serviced by staff from Townsville. Paluma is part of the site, used only in dry weather, however.
    N.B. Second centre planned at a site near Cairns.

4.22 FACILITIES DESIRABLE AT A FIELD STUDY CENTRE:

In his submission to the Director General of Education in Queensland in 1974, Mr. J. Althaus stressed the need for the structuring and planning of a studies centre to be under the control of those charged with the establishment of that centre. He gave the following as a basic list of facilities.

(a) a room suitable for screening films and holding meetings;
(b) work space and storage facilities;
(c) small library to house reference material;
(d) display boards and cabinets;
(e) a diverse range of environmental resources built up in the grounds. These might include such things as forestry plots of both indigenous and exotic species, gardens of native plants, ponds, small demonstration plots of crops, beehives, and bird feeding stations;
(f) provision for some type of extended accommodation at a later date.

The closed school used by Stanley River Field Study Centre in Queensland.

Activities at the Fortitude Valley urban centre.

4.23 AN EXAMPLE OF A FIELD STUDY CENTRE:

Stanley River Field Study Centre was established by the Queensland Department of Education on the site of the closed Hazeldean State School in July 1975. The centre is designed partly to meet the needs of both pupils and teachers from primary and secondary schools for short-term field experiences where day visits or over-night trips are appropriate.

The particular site was selected as a field study centre because the surrounding district offers a wide range of natural and man-modified environments suitable for field study activities (for example, dry eucalypt forest, freshwater lake, and grazing community). The availability of such areas is important because the main role of the centre is to show teachers how they can help their pupils achieve the aims of environmental education by making use of local resources.

Environmental education is interdisciplinary by nature. Therefore the general programs offered at Stanley River involve an integrated approach, drawing on traditional subject areas such as science, social studies, art, language arts and mathematics. Prepared activities include studies of:

- habitats (e.g. freshwater lake, vine forest)
- living and non-living components of a habitat (e.g. plants, animals, soil, rocks)
- man's past and present use of his environment (e.g. historical aspects, environmental degradation and resource management).

Resources available include:

Surrounding district —
Dry forest, vine forest (reduced form of rainforest), savannah woodland, freshwater lake (Somerset Dam — man-made).

Primary industries in the district include beef production (including an abbattoir), dairying, and forestry (including a timber mill).

At the Centre —
Within the grounds of the centre the following areas are being developed to demonstrate to teachers some projects in resources management that can be undertaken in their own school grounds:

Native forestry plot, native plant garden and nursery, orchard, vegetable garden.

The old classroom has been converted to provide teachers with ideas for classroom displays and activities.

Pre-visit preparation
Once a booking has been confirmed, one of the staff from Stanley River will make arrangements to visit the school. This will normally take place on a Monday or Friday approximately two weeks before the excursion. The teacher from the centre will conduct a short session with the class to:

- stimulate interest in the excursion and the areas to be studied;
- specify clothing to be worn and items to be brought; and
- discuss a code of behaviour (including safety procedures) to be adopted.

Another important aim is to provide the teacher with the opportunity to discuss:

- details of the excursion, including the programme to be undertaken
- preparation of children for carrying out field study activities
- teacher preparation for enhancing the benefits to be derived from the excursion.

The major preparation of children should involve the development of a few particular skills that will help them undertake the activities at the centre. For example, to classify rocks on the basis of say, hardness, children need to be familiar with the process of classifying. The Stanley River staff therefore suggest that before the visit it may be necessary to:

- develop observational skills using all the senses
- introduce some environmental terms and concepts that may not have been previously encountered (e.g. the meaning of the term 'leaf litter', and the concept of interdependence);
- provide practice in some techniques used in field studies (e.g. measuring and recording field data on a worksheet, or using a dichotomous key).

Before the excursion, teachers are provided with an Introductory Field Studies Teacher Workshop Kit. Included in the kit are five Introductory Field Studies Activities, accompanied by teacher's guides. The kit also contains 12 large colour photographs of water birds that are commonly observed on Somerset Dam, tree indentification cards and slide packages.

Role of Class Teacher at Stanley River

No teacher is expected to conduct field study activities on his or her first visit. However, on overnight excursions, assistance is expected in helping the children to set up camping equipment and in accepting responsibility for them during the night.

4.24 THE MOBILE FIELD STUDY CENTRE:

While Field Studies Centres have been established in Education Regions bordering the coast of Queensland, the needs of students living in more remote areas have not been forgotten. The Committee to administer the Joint Programs in Priority Country Areas agreed in 1977 to fund vehicles, equipment and staff for a Mobile Field Study Centre based at Roma in the South-West Region. The unit, in operation since October 1977, consists of a caravan, land cruiser (tows the caravan) and a Valiant sedan which has a trailer to carry beds and tents. There are four trained teachers in the team and a unit support officer. Equipment includes ten 4-man tents, beds and barbecues for the children, water tank, gas and electric refrigerators, gas and electric lighting, 240 volt generator, telescope, 20 binoculars, 6-7 microscopes, ropes for abseiling, insect collection equipment, 4 cassette recorders, Minolta camera, water and soil testing equipment.

The programme covers all subjects in the school curriculum as well as adventure programmes. It also caters for all schools, Government and Independent. The facilities of the Mobile unit may be used by the school for one, two and three days.

Plans are still being made to staff another mobile when finance is available.

4.25 TRAINED STAFF FOR THE CENTRES:

Applicants for advertised positions in Field Study Centres undertake a 5 weeks training course. This includes such topics as —

Philosophy and aims,
Basic field skills,
Resource areas and personnel available e.g. Forestry, National Parks Service, Museum, etc.
Psychology e.g. group dynamics
Land Management
Administration of Centre
Photography and slide preparation
Urban studies
Exercise in devising a programme.

One week in the five is spent working in a Centre with experienced Staff. The course is mounted only when the need for a certain number of new staff arises.

Inservice courses for the staff are held at regular intervals — one proposed for late 1978 was a combined media — photography school. In August 1978, a live-in course for all centre staff and organisers was held at Gympie, a course run by the Forestry Department, focussing on land management. A course held for 1 week at the end of 1977 included input from the Forestry Department, Botanic Gardens, mines museum and the staff of the Fortitude Valley urban centre.

The field study centre system is aided considerably by a team of seven "organisers" who not only visit schools to help in school projects, but spend time at the Centres to assist staff, help organise the inservice courses, and generally act as advisors.

4.26 SELECTION AND MANAGEMENT OF SITES:

In 1974 a management policy was proposed, and this policy in 1979 was still being carried out in all centres. An extract from Mr. Althaus' policy is as follows: "It is intended that Field Study Centres be fully regionalised with a number of centres in each region. The centres will be located in urban, suburban, rural and wilderness settings so that natural, man-modified, and man-made environments can be examined. Initially it is intended to establish two major permanent centres in each of the larger regions, one predominantly urban and the other predominantly rural. In addition a number of auxiliary sites will be maintained in order to rest the major sites and to provide facilities in more remote areas where the distribution of schools is sparse and travelling distances are large. Staff and equipment will be moved to these sites as required. This mobility of staff and equipment will be essential if all areas of the state are to be adequately serviced".

In addition, each centre is planned, if possible, so that it has two working areas in the field, one of which can remain unused for some length of time e.g. Pimpama at Jacob's Well hasn't been used for 18 months. The staff at each centre, as mentioned in the section on training of staff, is given a course on land management, and each centre is given an overall policy on management and over-use for that centre.

4.27 LIAISON WITH OTHER BODIES:

Seven of the state's centres are on land leased from the State Forestry Department, but all the centres use State Forests for part of their field studies. A very good relationship exists between the Education Department and the Forestry Department, and Forestry personnel take a large part in inservice training. The need has not arisen as yet to make use of National Parks but it has been policy to avoid this if possible because of their more restricted use.

4.3 MAROON OUTDOOR EDUCATION CENTRE:

A centre not strictly classified as a field study centre is the Maroon Outdoor Education Centre, worthy of mention in this survey because its programmes include an environmental education component. In August 1975, the Maroon Outdoor Education Centre was opened at Maroon Dam on a site owned by the Irrigation and Water Supply Commission. The centre accommodates 120 students, and a group of this size must be accompanied by six or seven teachers who work as a team with the Centre's staff. The Centre is available for independent programmes at weekends, but for the longer camps, which have to be booked up to a year ahead, intake is restricted to students from Miles eastward and Gympie southward.

All Maroon programmes aim to integrate three components — adventure (in the form of individual challenge), the personal and social development of the student, and environmental education. The site and its varied surroundings do much to help the achievement of this integration.

The Centre, nestling between Mts. Maroon, May, Ballow and Toowoonan, is ideally located for studies in the environment. Sheoaks, bottlebrushes, black beans, blue gums and ironbarks line the creek banks and there are national parks on the slopes of the nearby mountain.

Although the Centre offers didactic programmes with titles like Trees of the Eucalypt Forest and Ecology of the Freshwater Lake, much of the student's developing awareness of the environment comes from within himself. A feeling of affinity with the environment flows directly from living and working in it.

4.4 A PRIVATE VENTURE — BINNA BURRA ENVIRONMENTAL STUDIES CENTRE:

In 1973 Tony Groom, part owner of the Binna Burra Lodge in Lamington National Park, went to the United States on a Churchill Fellowship. When he returned, he initiated the establishment of an environmental studies centre, assisted by the Lamington Natural History Association who lease the land from Binna Burra Lodge. The centre was given an innovations grant from the Schools Commission in 1975 and the centre opened in 1976.

At present the environmental study centre (residential, 36 beds) is designed to operate without a full-time teacher, so, with the help of a prepared teachers' guide, the class teacher designs a programme for a short (3 day) or longer (7 day) stay. The guide is for a programme based on the goals of environmental education, an interdisciplinary approach, and is one of the few guides seen in Australia that aims to truly reflect the aims of the Belgrade Charter. (See Appendix A for an outline of this Teachers' Guide.)

Unfortunately, teachers have little success in implementing this programme on their own. Mr. Groom has had no success in obtaining a teacher from the Queensland Education Department, and in 1979 applied to Utah Mining Australia Limited for a grant to finance a resident teacher. This too was unsuccessful, and he is now looking even further afield for a grant which will enable this centre with magnificent resources to be used to its full potential

TABLE 4.1
For Key see Table - 3.41, 3.42, 3.43

Centre		Authority	Resid. or Day	Staffing	Programmes	Major Ecosystems
(1)	Dunwich Research Station (Q. Univ.)	B	Resid.	C	3	Stradbroke Is.; swamps, dunes, marine
(2)	Eprapah F.S.C. (Scout Assoc.)	C	Camping	C	3	Dry forest, rainforest remnants, swamps, mangrove creek, estuarine & tidal zones
(3)	Fortitude Valley	A	Day	A	2	Urban Centre
(4)	Heron Is. Research Station	B	Resid.	A	3	Marine, Pisonia forest, coral reef, sand-dune succession
(5)	Jacob's Well	A	Resid.	A	2	Mangrove, wetlands, dry forest, rural
(6)	Maroon Outdoor Educn. Centre	A	Resid.	A	4	Freshwater dry forest
(7)	Stanley River	A	Resid.	A	2	Freshwater, rural, dry forest, scrub
(8)	Numinbah Valley	A	Resid.	A	2	Dry forest, rainforest, freshwater, rural State forests
(9)	Sunday Creek	A	Resid.	A	2	Rainforest, wet sclerophyll, dry forest, freshwater, rural, State forests
(10)	Amaroo	A	Resid.	A	2	Dry forest, freshwater, rural, rainforest
(11)	Dunwich Field Study Centre (temporary lease by North Brisbane C.A.E.)	B	Resid.	C	2	Stradbroke Is.; swamps, dunes, marine
(12)	Bunyaville — Sunnybank	A	Day	A	2	Freshwater, dry forest

(13)	Ironbark (St. Peter's Lutheran College)	F(b)	Resid.	A	2 and	North of Toowoomba; dry forest, creeks dams, rural
(14)	Moogerah Dam (Brisbane Boy's College)	F(b)	No reply to letter requesting information			Freshwater, rural, dry forest
(15)	Atkinson Dam (Queensland Institute of Technology)	B	Resid.	C	3	Near Laidley, 100km from Brisbane
(16)	Mary River	A	Resid.	A	2	Rural, dry forest, rainforest, freshwater
(17)	Boyne Island	A	Resid.	A	2	Mangroves, dry forest, rural, urban-industrial
(18)	Townsville Environ. Ed. Centre	A	Resid.	A	2	Rainforest, dry forest, rural, urban, mangroves, wetlands, marine, freshwater
(19)	Columboola	A	Resid.	A	2	Rural, Cypress forest, freshwater
(20)	Camp Fairburn (No. of schools in Emerald district)	F(a)	Resid.	A	4/3/2	Island environment, rural, open forest
(21)	Binna Burra Centre (Natural History Assoc.)	C	Resid.	C	2	Lamington National Park; rainforest
(22)	Camp Bornhoffen (Police Youth Club)	C	Resid.	A	4/3/2	Numinbah Valley; dry forest, creek, rainforest, rural State forests
(23)	Pepperina Hill Moogerah Dam	F(b)	Resid. Brisbane Grammar School	A and D	3 and recreation	Freshwater, open forest, rainforest
(24)	Peel Island (Church of England Grammar School)	F(b)	Resid.	C and C	3 and recreation	Coral zone, coast, dry scrub, lagoon

CHAPTER 5 — FIELD STUDIES CENTRES IN SOUTH AUSTRALIA:

In South Australia there is not a fixed centre in each educationally valuable area — there are only three facilities which come close to the working definition, Arbury Park, Para Wirra and Quorn.

Many schools have their own type of field centre, some as a group and some as individual schools. Many schools acquired closed schools for the purpose of outdoor education, but in the main these are being badly managed and not used. However, the concensus of opinion in South Australia, at the grass roots level, is that teachers and children do not need more traditional field centres, but more advisers in the regions to help in the use of environmentally suitable areas, using them as camp sites. A number of people interviewed stated that the ideal for the State in their opinion was a range of models for outdoor education (as they prefer to call it):-

1. A small number of the fixed, staffed Arbury Park type
2. A larger number of centres managed and staffed by teachers from one or more committed schools
3. Suitable areas used as field sites with camping gear and qualified teachers
4. Environmental advisers in each region to act as a resource pool for inexperienced teachers wishing to use suitable habitats.

South Australia has no written policy in regard to environmental education and it seems that the development of regionalism within the Education Department is making it difficult for any action to come from the central authority — if it has any authority in this matter. Within certain regions, however, there is a good deal of action; moves are occurring to develop regional policies. On a regional level a few advisers have been appointed; in the Central Northern Region, for example, Mrs. Jean Whimp is allocated for 5/10 of her time as adviser to Para Wirra Study Centre, 3/10 on outdoor education for the region, and 2/10 as camps organiser in Elizabeth West High School. Mrs. Whimp is therefore a channel of communication on environmental education to all the member schools in the region: inservice courses are being planned, interested teachers in the region are being drawn together to work towards a curriculum framework for the region (not a separate subject for environmental education, but foci within the whole curriculum) and written resources are in draft form.

Both the Education Department and the National Parks and Wildlife Service agreed (separately) that an ideal model would be a building, in a Park, owned by N.P.W.S. and staffed by the Education Department. It only remains for someone to take the initiative and foster the development of an education policy at joint top level across the two departments.

The National Parks in South Australia show a sufficient variation in animal populations, topography, vegetation and soils for a system of centres to be developed which would give a complete sampling of different environments and illustrate diversity of habitat. The N.P.W.S. spokesman said that with the co-operation of the Education Department for staffing, he would favour the setting up of such a system where management was under the control of the Service.

South Australia has a large number of standing camps for use by schools — see list in Appendix B — and one can see why teachers in South Australia are reluctant to ask for purpose-built field studies centres when so many other potential study sites already exist.

There is an Outdoor Education Project Team whose role is advisory, but the impression gained was that their skills were more in the recreation/adventure area than in planning environmental education elements for an integrated curriculum. Regional advisors are still the basic need to make the use of the standing camps worthwhile for environmental studies.

5.1 FIELD STUDIES CENTRES IN SOUTH AUSTRALIA:

The following descriptions apply to sites or areas used in South Australia, mainly by school groups and tertiary students, but is only a sample of sites used. The list had been compiled merely to represent the diversity of venues, with particular emphasis on the most recent developments.

5.11 ARBURY PARK OUTDOOR SCHOOL:

The Outdoor School at Arbury Park is owned and operated by the Education Department of South Australia and was funded partly by a Schools Commission innovations grant of $220,000 with the balance of approximately $500,000 coming from State revenue. It is situated 23km from Adelaide near the township of Bridgewater in the Adelaide hills. It caters for Primary and Secondary students, with their teachers, either on a Monday to Friday basis or over a weekend. The site is in use every week of the school year and demand for use of the site is approximately four times that which can be accommodated.

The facilities, designed to cater for up to 96 children plus teachers, include dormitory units, a gymnasium, teacher's residence, tennis court and a main building which has Withdrawal Rooms, Wet Areas, general purpose dining area, kitchen, laundry and offices The 94 hectares of land includes natural bush, de-natured areas, dams, a nursery of European trees and Cox's Creek, which was used in earlier days to operate the flour mill at Bridgewater. The area abounds in bird and insect life. The broad aims of the Arbury Park Outdoor School are as follows:

(a) To provide experiences for children which will enable them to develop positive attitudes to, and respect for, the environment.

(b) In a setting which is different from the normal school, to give teachers opportunities to relate curriculum directions to real life situations, and to assist them in programming with ideas and resource material.

(c) To introduce children to new choices of leisure activities centred on the outdoors.

(d) With special programme components to improve interpersonal skills amongst children, and between staff and children, taking advantage of the already improved relationships which result from the residential nature of the course.

The Principal and two teachers appointed to the school work in a consultative capacity, assisting teachers to plan for the experiences which are designed to meet the particular objectives that those teachers hold for their field study experience. Another obligation of the permanent staff at Arbury Park is to assess the most valuable learning opportunities at the site and to produce material which will clearly identify useful areas and possible approaches to aid teachers in their planning and conduct of courses. For particular activities, where the visiting teachers require some form of assistance, the permanent staff will work with those teachers and children in the role of activity leaders. It is the philosophy of the permanent staff to allow the visiting teachers and children the maximum opportunity to operate and succeed in their own activities, in order that they should develop more expertise and confidence that will better fit both teacher and children for future activities in the field. The latter could well take place as an extension of experiences practised at the Outdoor School, when they return to their own school in the areas immediate to their own school, and then they go on other outdoor education visits.

As is the case with most residential sites the opportunity for a diversity of activities is evident, and so there will be times (e.g. Year II Geography camp) when the site would operate chiefly as a "Field Study Centre". If a particular residential experience is designed by the teachers to contain a strong recreational component then the description of the site might be different. However, the strongest thrust at the school is in the areas of environmental education, and so to a large extent the Arbury Park Outdoor School could be defined as a Field Study Centre.

5.12 COCKATOO VALLEY ANNEXE (WOODVILLE HIGH SCHOOL):

In 1977 Woodville High School began using its new centre at Cockatoo Valley in the Gawler area, north of Adelaide. Three members of the High School staff work permanently at the centre and function very much in the same way as do the Arbury Park Outdoor School staff. The main aim of the on-site staff at Cockatoo Valley is to integrate the country property with the school, so that eventually most syllabi will be adapted to cater for activities at Cockatoo Valley. The method used by the permanent staff in their liaison with the home High School staff is as follows:

(a) Establish the main topics for that camp.
(b) Develop goals for those main topics.
(c) Formulate specific objectives from each goal.
(d) Produce a programme to meet the specific objectives.

This technique is seen to give the preparing teachers a framework for understanding the purpose of their visit to the Cockatoo Valley site. It enables the formulation of a programme which can be readily justified to students, other teachers and parents. As is the case at the Arbury Park Outdoor School the result of this consultation in the planning stage means that all staff attending the camp are more committed individually to implementing the programme because of their initial contribution to that programme. In addition, all staff are better informed and more enthusiastic on the site.

At present the Cockatoo Valley site comprises two dormitory units (Atco-type buildings), two portable classroom buildings (one of which will serve as an activity room), toilet/shower block, large dining room/kitchen area, and the availability of a bus which is permanently attached to the Woodville High School.

5.13 NARINYERI, HINDMARSH ISLAND (MURRAY PARK COLLEGE OF ADVANCED EDUCATION)

Eighty eight kilometres south of Adelaide, Murray Park C.A.E. Student Association has control of 43 acres on Hindmarsh Island, adjoining the Coorong. The site is beginning to experience increased use by student groups but until this year had only had minimal use.

The Narinyeri site has limited permanent buildings and has been established for canvas camping. The location is very rich in activity possibilities of an environmental nature and a recent in-service conference conducted there under canvas explored some of these possibilities. The use of Narinyeri as a Field Study Centre will depend very much on the sort of assistance that can be provided for intending user groups. It is reasonable to suggest that use of the site would increase as exit students from Murray Park C.A.E. take their place in the teaching profession and generate greater use of the Narinyeri site.

5.14 PARA WIRRA STUDY CENTRE

An area of the Para Wirra Recreational Park has been developed as a Field Study resource by the four Secondary Schools within the Munno Para District Council, (Craigmore, Elizabeth West, Gawler and Smithfield Plains High Schools). A $20,000 Schools Commission innovations grant made possible the construction of a large building constructed mainly of pinus radiata logs.

The erection of a building followed several years of intensive use and development of specific programmes for the Para Wirra Park by the afore-mentioned schools. Now that a building exists to support that commitment to Field Studies, the schools have an area which can provide shelter from inclement weather, the capacity to stay overnight, and a resource centre in which displays can be mounted and hardwear and softwear kept handy to the work area.

The main feature of the developments at Para Wirra appears to be the concern that staff intending to use the area should initially become familiar with the process and content characteristics which apply at Para Wirra. Special in-service conferences have been held there, and Field Study guides ("The Birds of Para Wirra", and "The Plants of Para Wirra") have been produced. There has also been much progress made in the integration of subject content, thus enabling teachers from various faculties to work together, unlike the modus operandi in the usual school system.

Another feature of this establishment, is that planning and ongoing discussions occur between Education Department personnel and staff of the National Parks and Wildlife Department. Apart from the reciprocal advantage in the exchange of ideas and concerns, there is the opportunity for teachers working in the area to show officers of the National Parks that they have a significant obligation to the educative process when they are planning the facilities, functions and philosophies of a Park.

5.15 CLELAND CONSERVATION PARK

The Cleland Conservation Park is situated in the foothills of the Mount Lofty Ranges and occupies an area of 786 hectares. Of main interest to people involved in Field Studies, is the Fauna zone situated in the middle of that Park. In the past the Fauna zone attracted field academics and amateurs, conservationists, adventurers and tourists. Today, however, this emphasis has changed and the strongest user group is now school children. In 1975 over 6,000 children visited the park in the month of November.

Although the vegetation of the area is fascinating and diverse, school students mainly visit Cleland for studies of the native fauna. It is the significant use of the Park for field studies that could easily catagorize the establishment as a Field Study Centre. In fact, a large modern Interpretation Centre has just been completed at Cleland, and the National Parks and Wildlife Department has requested that the Education Department of South Australia supply a suitably qualified teacher to act as Education Officer at the Interpretation Centre. This building includes offices for the Park Rangers, an area for establishing the displays and a large area which will be used by the Education Officer to introduce school groups and tertiary students to the learning possibilities of the Park.

5.16 STOCKWELL CAMP

Stockwell Camp was once Stockwell Rural School which closed in 1972. The Principal of the Modbury Primary School at that time, Mr. Gerry Dillon, saw the opportunity and negotiated with the Education Department for the use of the school as a campsite for the children of the Modbury Primary School. The Department granted permission.

As a proviso of Modbury gaining the use of the school Modbury had to assume complete financial responsibility for the setting up and maintaining of all the buildings and facilities. No departmental help is given. In order to achieve this an enthusiastic band of parents has formed a committee which works hard and gives up much of its time through meetings and working bees. The children of the school raise money for capital expenditure with an annual "Walkathon" which besides the camp fees, is the only form of fund raising carried out on behalf of the camp.

It is the policy of the school that each class visits the school camp at Stockwell at least once per year. Two teachers, one male and one female, accompany each class to the camp. Camps vary in duration from overnight to up to a week, depending upon the programme and requirements of the teacher.

The school retains Stockwell camp on a ten year lease, so for the next few years at least, the students of Modbury Primary School may continue the use of this excellent facility.

Attractions of the Area

There are several attractions to the area. One of the main attractions for teachers is the proliferation of wineries in the area. Vineyards abound near the camp and there is also grazing of sheep, cattle while pigs are also kept. Community studies (rural) are possible with history and geography integrating. There are brickworks in Nuriootpa and a flour mill in Stockwell itself. There are creeks in the area with permanent water holes making creek and pond studies possible. Many interesting walks are possible and there are bicycles for those who wish to range further afield — small groups for the last activity please.

5.17 CAPE JERVIS (a centre controlled by an individual school)

The following is part of a letter sent to parents by the Principal of Marion High School, Clovelly Park:

> "Marion High School is fortunate in having its own Field Study and Conservation Park at Cape Jervis which, thanks to the effort of parents, teachers and students, is available for use by all 8th and 10th Year students. The curriculum for these students includes a period of study at Cape Jervis and it is expected that all students will attend. Year 8 students spend three days and Year 10, four days there.
>
> "These field study experiences are designed for intensive study rather than recreation. Subjects covered include the history of Fleurieu Peninsula, geography of the area, a detailed study of the environment, its botany and biology, art and creative writing. We believe that there is, in addition to this valuable study programme, a great deal of benefit to be gained from the social learning that a camp provides."

The 70 hectare campsite is in the Yankalilla Council District near the deserted Talisker settlement overlooking Backstairs Passage and Kangaroo Island. The main building is a fully lined, steel-framed structure 23m x 7.6m containing two dormitories and a multi-purpose work area. Up to 42 students can be accommodated in the bunk beds. Toilets and showers are provided in a separate ablution block. Bottled gas is used for cooking and heating while a small generator provides power for lights.

The property was purchased by Marion High School in 1973 and has been gradually developed with the help of students, parents and staff.

AIMS OF THE PROGRAMME:

Provide students with opportunities

1. To become aware of the natural environment.
2. To recognise the need for conservation.
3. To improve their observational skills and their ability to record information.
4. To experience new sense impressions of the natural environment.
5. To be involved in a variety of studies relating to the natural environment.
6. To appreciate more fully the beauties of nature.

TABLE 5.1

For Key see Table - 3.41, 3.42, 3.43

***Fully set up and operational**

Centre		Authority	Resid. or Day	Staff-ing	Pro-grammes	Location
(1)	Arbury Park Outdoor School	A	*Resid.	A	2	Mt. Lofty Ranges
(2)	Para Wirra (4 High schools)	F(a)	*Resid.	B	2	Para Wirra Recreational Park
(3)	Cape Jervis (Marion High)	F(a)	*Resid.	B	2	Fleurieu Peninsula
(4)	Coobowie (Yorketown area)	F(a)	*Resid.	C	4 and/or 2	Yorke Peninsula
(5)	Quorn Outdoor Education Centre	A (Priority Projects)	*Resid.	A	2	Flinders Ranges
(6)	Cockatoo Valley (Woodville High)	F(a)	*Resid.	A	2	N. Mt. Lofty Ranges
(7)	Forreston School (Croydon High)	F(a)	*Resid.	C	Mainly social development	N.E. Mt. Lofty Ranges
(8)	Wardang Is. (Dept. of Further Education)	A	*Resid.	A	2	Wardang Is.
(9)	Kapunda Convent (Para Vista High)	F(a)	*Resid.	C	2	Kapunda
(10)	Mambray Creek (Daws Road High & Salisbury C.A.E.)	B & F(a)	*Resid.	C	2	S. Flinders Ranges

(11)	Verdun Outdoor Camp School (Morphettville Park Primary)	F(a)	*Resid.	C	4 and/or 2	Mt. Lofty Ranges
(12)	Eden Valley School (Para Hills West Primary etc.)	F(a)	*Resid.	C	4 and/or 2	N.E. Mt. Lofty Ranges
(13)	Dublin (Salisbury High)	F(a)	?	C	?	N. Adelaide Plains
(14)	Avon-Klemzig Camp School (Klemzig primary)	F(a)	*Resid.	C	4 and/or 2	Mid North
(15)	Robe (Grant High)	F(a)	tents	C	?	South East
(16)	C.R. Neilson Camp Centre (Taperoo Primary)	F(a)	*Resid.	C	2	E. Mt. Lofty Ranges
(17)	Sherlock School (Tailem Bend Primary)	F(a)	?	C	4 and/or 2	Murray Mallee
(18)	Narinyeri (Murray Park C.A.E.)	B	tents	C	3	Hindmarsh Island
(19)	Woods Point Camp School (Christies Beach High)	F(a)	*Resid.	C	2	Lower Murray
(20)	Stockwell School (Modbury Primary)	F(a)	*Resid.	D	4 and/or 2	Barossa Valley
(21)	Clarendon (Glengowrie High)	F(a)	*Resid.	C	2	Mt. Lofty

(22)	Kangaroo Island Outdoor Education Centre	A	Resid.	A	4 and/or 2	Kangaroo Island
(23)	Goose Island (Scotch College)	F(b)	tents	C	2	Goose Island
(24)	Innes National Park (proposed)	E	Resid.	A (proposed)	2	South Coast
(25)	Willow Creek Farm	C	Resid.	A	2	Near Victor Harbour

N.B. Beltana Field Study Centre ceased operations in 1979 due to death of the Director.

CHAPTER 6 — FIELD STUDIES CENTRES IN WESTERN AUSTRALIA:

Western Australia is one of the few states in Australia with a Director-General's policy on Environmental Education. The Education Department also has an Environmental Education Committee and an Education Officer in Environmental Education (seconded for two years).

However, in a brief visit to that State, the opinion was formed that the average classroom teacher is not adequately trained to play the part required of him/her in the implementation of the policy statement. Few real field studies centres exist, these are not staffed to help the insecure teacher, and the network of camps which covers almost the whole of the State is dependent too on the expertise of the classroom teacher in outdoor skills. However, Jarrahdale has been one successful centre where an inservice course is held for teachers intending to use the centre, and work-sheets have been prepared to give both teachers and students guidance in the correct use of the area. But teachers who do not attend such inservice courses are still able to use the centre, as it is Education Department policy that this be so.

The Tomato Lake Field Study Centre was opened on October 8, 1975. A plaque beside the door reads:

> This is the first field study centre established in Western Australia.
> The primary objective of this centre is to develop a responsible attitude to, and an appreciation of the environment through three main aspects — aesthetic, scientific and economic, and the inter-relationships between these three.
> Organised by the Western Australian Naturalist Club.
> Financed by the Schools Commission with assistance from the Shire of Belmont.

The Tomato Lake Centre is in a unique situation right in the middle of suburbia — 7km from the G.P.O. The area has potential for studies in water birds, impact of man, woodland habitat, freshwater life and invertebrates. Kewdale Senior High has allocated extra duties to one teacher to supervise the centre and he does this in addition to normal school duties with the assistance of a senior student committee. But groups who use the centre (and these unfortunately are becoming less) must do so without a guide and without an adequate supply of prepared programmes. Members of the Steering Committee originally set up to develop the centre are disappointed that the Education Department has not continued to develop the centre and encourage the use by schools and community as originally envisaged by that Steering Committee.

However, in a paper presented to the National Gould League Conference in 1977, it was pointed out that this centre does not come under the jurisdiction of the Education Department Field Studies Officer, so perhaps there is some lack of communication concerning administration and staffing.

Mundaring Weir Field Study Centre, a fibro cottage donated by the Forestry Department, was opened in 1979 to cater for day visits. However, this centre needs a great deal of promotion, it needs prepared materials, and it needs at least part-time staff. The Environmental Education Officer, Keith Anderson, is very much aware of the need for finance for the development of adequate facilities and for inservice and workshops to write materials.

King's Park Education Centre is claimed by its education officer to be a field studies centre, or rather an environmental studies centre, because all the programmes are designed to be used in the "field" and are structured around the development of a total environmental awareness. The education officer visits every school before the excursion and talks to teachers and students. Teacher's notes are supplied a month before and most children come in well prepared; the centre's officer claims a high success rate for visits to this particular centre. A disappointing feature is the lack of adequate staff to enable the centre to be open at week-ends.

Plans are well underway for an Urban Studies Centre to open in Fremantle, the chief port of Western Australia. Keith Anderson, Environmental Education Officer for the Education Department in Western Australia, supplied the following information.

Fremantle is rich in history and community spirit, containing a wide variety of urban environments. The city is a living, breathing, working "museum" that has successfully incorporated the old with the new.

The Urban Studies Centre is to be established by the Fremantle Community Education Centre with co-operation from the Education Department and the Fremantle City Council. The Community Education Centre is located in the old Princess Mary Girls' School built in 1901, and the Urban Centre will use two or three of its rooms, one of which will be converted into a theatrette.

It is anticipated that both students and adults will be able to make use of the Urban Centre, and a wide range of activities, worksheets and resources is being planned.

In opening the Urban Centre a new era of community liaison and co-operation will begin. Various local associations, City Councillors, Regional Education Officers, Community Education Centre staff and Education Department staff have all expressed their willingness to participate in providing help and resources. No staff will be attached to the centre.

The Urban Centre is also expected to become part of the resources available to teachers during out-of-school hours for research and preparation of programmes involving Fremantle. Inservice courses and teacher workshops are also being planned to make full use of the Centre. In many ways the Urban Centre will provide the stimulus and resources for teachers wishing to make greater use of their city as well as for those teachers who are just visiting.

TABLE 6.1
For Key see Table - 3.41, 3.42, 3.43

Centre	Authority	Resid. or Day	Staffing	Programmes	Ecosystems
(1) Jarrahdale	A	Resid.	C	2	Forest, town
(2) Tomato Lake	A	Day	B	2	Lake, urban, woodland
(3) Mundaring Weir	A	Day	C	?	Forests
(4) King's Park Education Centre	A	Day	A	2	Park
(5) Pt. Peron Camp School	A Physical Education Branch	Resid.	A	4	—
(6) Pemberton Camp School	A P.E. Branch	Resid.	A	4	—
(7) Bridgetown Camp School	A P.E. Branch	Resid.	A	4	—
(8) Bluff Point Camp School	A P.E. Branch	Resid.	A	4	—
(9) Carnarvon Camp School	A P.E. Branch	Resid.	C	4	—

The following field stations are believed to be operated by the University of Western Australia, but no reply to a request for information has been received.

1. Albrolhos Island Camp
2. Garden Island
3. Jandakot Field Station
4. Rottnest Biological Station
5. Tutanning

CHAPTER 7 — FIELD STUDIES CENTRES IN THE NORTHERN TERRITORY:

The Batchelor Education Village Field Centre is the only institution which would fit into any field centre classification, its emphasis being mainly on adventure type programmes for primary pupils, with some nature study type activities. The school-oriented environmental education movement is still in its infancy and probably 8-10 years behind the other states, according to Dr. Jim Cameron (Curriculum Branch, Department of Education). However, the Education Department does lay claim to some long range plans such as

(1) a small number of fixed, staffed sites, e.g. Channel Island.
(2) a larger number of sites with no fixed facilities and mobile in the sense of having camping gear available; written resource material would also be available for teachers.

The Northern Territory Education Department sees its model centre more as an Outdoor Resource Centre rather than a Field Studies Centre because their philosophy embraces not only an increased understanding and appreciation of the environment but the opportunity to include meaningful recreational experiences and some personal development.

There is a consensus in the Territory that the concept of a Field Studies Centre is a worthwhile one, but would a staffed and equipped facility (residential or not) be a viable proposition with problems such as —

(1) numbers — only six High schools in the Territory
— small adult population
— interested tourists an unknown quantity
(2) finance — all projects are more expensive than in the south
(3) accessibility — isolation or disuse in the wet season

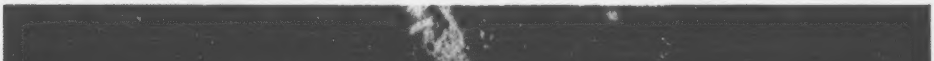
Ayer's Rock — Mount Olga National Park (Uluru) has vast potential for environmental education, but nothing has been done to date. Not only is it a unique geological area, but its Aboriginal associations, both past and present, are of great significance, and rather than just being a tour for school groups and adults, the Uluru experience should be one based on the development of new awareness and new responsibilities. A staffed field studies centre with prepared educational materials for both children and adults would be well patronised.

Plans for educational programmes have been included in the draft plan of management for Kakadu National Park (released early 1980). This park is under the control of the Australian National Parks and Wildlife Service (a Federal body). Prescriptions on education include:

(1) Plans for a field studies centre to be built in 1982
(2) A training programme for aboriginal rangers
(3) General training programmes on park values for the mining community
(4) Training programme for local people.

Two interpretive centres are being built this year (1980), one at Jabiru and one in the East Alligator district. The East Alligator complex, designated a Resource Education Centre in the Design Report (May, 1979), is planned to be the headquarters for all educational programmes in the Park. In the introduction to the Design Report, Allan Fox pointed out that the successful management of Kakadu could well depend on the provision of adequate training programmes as special circumstances will apply during the initial stages of the Park.

Education is needed to protect this land from vandalism - the Northern Territory



Education is needed to explain and preserve our aboriginal cultural heritage.

These include:

1. The necessity to rapidly staff the management programme to control the impact of the mining industry, and expected boom in visitors (local, interstate and international) and to protect the globally important resources of the Park — many of them quite fragile and irreplaceable.
2. The nature of the fragile and irreplaceable natural and cultural resources.
3. The need to progressively involve Aboriginals in the staffing programme from ranger through to superintendent.
4. The need to ensure the competence of tour leaders and contractors.
5. The need to train strategic personnel of the mining and construction staffs in the philosophy and methods of national park management.

When the field studies centre is completed in 1982, it will take over the educational role for all community and school visitors, while the Resource Centre will house the collections, provide facilities for staff research, and cater for the training of all Park personnel and visiting rangers from interstate and overseas.

The present plan for the field studies centre is to establish a line of communication between the Kakadu management and the interested section of the community in Darwin, both European and Aboriginal, to ascertain their needs and interests. The Service is prepared to engage an education officer to manage the field studies centre so that it can be open seven days a week, not restricted to schools, but available to the community as well. For example, the centre is seen as a site for the activities of community groups such as the Jabiru Field Naturalists' Club. It is important in the planning stage of the centre that it be seen as a base from which groups will go out to work in the field.

CHAPTER 8 — THE AUSTRALIAN CAPITAL TERRITORY:

At the present time there is no field studies centre operating in the A.C.T. although the new Birrigai Recreation Camp opened at the beginning of 1980 has environmental education as one of its aims. But it would be wrong to say that field studies are not undertaken by schools and universities; the situation in the A.C.T. appears to be a special one, and the opinion voiced in Canberra is that the A.C.T. does not need field studies centres.

Many schools visit the Tidbinbilla Nature Reserve which is under the control of the Department of the Capital Territory. Guidance there is available from an extension officer who has many other duties besides educational ones. City hilltop reserves are also widely used by local schools. The Y.M.C.A. camp at Long Beach, north of Bateman's Bay is also well used by A.C.T. students; up until 1979 a trained teacher had been operating there to advise with fieldwork. Another Y.M.C.A. Camp, Camp Sturt, is also available to primary and secondary schools and has performed a useful function in the development of environmental education in the A.C.T. The site is on the edge of the Molongolo and Murrumbidgee Rivers, and has been unfortunately overworked; the site is now degraded and the camp should be moved to another position.

Following is a list of residential sites used by A.C.T. schools, using their own staff and a programme of outdoor education which is mainly social/recreation/adventure:

- Camp Sturt, Y.M.C.A. site, Molongolo and Murrumbidgee Rivers
- Longbeach, Y.M.C.A. site, north of Bateman's Bay
- Greenhills Conference Centre, Cotter Road, A.C.T.
- Fitzroy Falls Conference Centre, Fitzroy Falls (Bowral)

In 1974 the Canberra College of Advanced Education built its own centre at Jervis Bay — a site chosen because of its potential for coastal studies, with student visits also organised to Kinchega National Park, New South Wales, and to the Kosciusko Chalets, the staff is attempting to provide a variety of habitats for student studies.

In February, 1980, the Birrigai Recreation Camp opened on land adjacent to the Tidbinbilla Nature Reserve, a residential centre to serve both the schools and the community, a joint venture by the Department of Capital Territory and the A.C.T. schools Authority. The Camp is classified as an Outdoor Education School, but Doug Coreau, the Teacher-in-Charge claims it is the first field studies centre for the A.C.T. even if not in name. Mr. Coreau is interested in developing an integrated programme using the outdoors as a methodology as opposed to a curriculum alternative, e.g. if a class plans a science excursion at the centre, he will aim to integrate the science with other curriculum areas. The broad aim of the programme is environmental education, rather than environmental studies. The major thrust will be the use of the environment as a teaching method to stimulate learning of concepts difficult to grasp by chalk and talk methods.

However, the three teaching staff planned for appointment in 1980 will not be appointed for at least the first six months, and Doug Coreau and the Camp manager will be the only staff. Already bookings are heavy; Mr. Coreau therefore plans that the camp will provide a facility for teachers to use with their own programmes, although some prepared units will be available.

The Department of Capital Territory's Recreation Branch plans to use the camp at weekends and school holidays for community based programmes.

An employee of the Conservation and Agriculture Section of the Natural Resources Branch, already operating as a guide for student visits to Nature Reserves, believes that the A.C.T. does not need field studies centres (and other people in the A.C.T. agreed with this point of view). She pointed out that Canberra is a special case, where every school is near a vegetated hill, and if the teachers could be properly educated to use these local areas, there would be no need for fixed centres with permanent staff. This particular government department has plans to prepare written materials showing teachers how to use their local reserves, e.g. a school at Belconnen could use Tidbinbilla Reserve, then look at a wetland area such as Lake Ginninderra, or study the dry sclerophyll at Black Mountain; notes would be prepared for teacher guidance in each area.

In 1971 a submission for a field studies centre in the A.C.T. was actually made to the Senate Standing Committee on Education, Science and the Arts. The submission was refused, but to-day some members of that interim committee which made the submission agree with the opinion above that it is a special kind of teacher training that is needed now in the A.C.T., not field studies centres.

However, Doug Coreau, the teacher-in-charge at Birrigai, is one person who claims that the A.C.T. does need field studies centres. He pointed out:

1. Although schools have access to nearby parks, most schools need a more completely natural area for study rather than a man-made park (this is especially so with secondary schools). However nearby reserves with suitable resources could be used to advantage.
2. A residential centre has certain benefits from a social development point of view.
3. Teachers are able to find specialised help — staff expertise is available in a centre.

CHAPTER 9 — FIELD STUDIES CENTRES IN NEW SOUTH WALES:

The existing network of field studies centres in New South Wales has grown up at random and indeed, some which claim to a position of importance in the Network, were established in the first instance without knowledge of the intentions of field studies nor of the purposes of field studies centres.

Allen Strom (personal comm. 1980) believes the first outdoor centre in New South Wales with a programme of field studies was the Broken Bay National Fitness Camp. On this matter, Mr. Strom says, "The Broken Bay Sport and Recreation Centre which was established as the Broken Bay National Fitness Camp in 1939, seems to me to have fallen into the pattern of field studies for school camping programmes, simply because of the accent given to natural science at the first school camp held there in November, 1940. In struggling to get a name that was NOT nature studies, "field studies" was used to cover plant studies, animal studies, rock studies, bushcraft and what would now most likely be called studies of the natural environment. Field studies spread to other national fitness camps as school camping was extended, and the quality of these field studies was (and still is) directly proportional to the interests and capacities of the teachers on the staffs of the school camps. For example, whilst Allan Fox was on the staff of Broken Bay National Fitness School Camp, the field studies programme involved besides those areas mentioned above, considerations of aboriginal occupations of the land, resource use and management, and the relating of the camp environment to the child's home environment. The last time I visited Broken Bay Camp, I got the impression that children and teachers were on a par as far as background was concerned and consequently, "field studies" were an opportunity to ramble without purpose".

In the last few years, because the Education Department has refrained from taking a strong hand in planning the future of field studies centres, and because those field studies centres staffed by Departmental officers refuse to take other than Government school pupils, some enterprising organisations and persons have established private field studies centres.

Information is given below on a selected number of centres in New South Wales, each with a different kind of management, and a different kind of emphasis.

9.1 A sample of centres from the ten staffed by the Department of Education include Awabakal, Bournda, Dorroughby and Brewongle.

AWABAKAL

Awabakal Field Studies Centre is adjacent to Dudley Primary School, and is on the edge of Awabakal Nature Reserve. The aims of this centre are representative of those of the other nine centres staffed by Education Department teachers. The centre was established to promote the aims of environmental education by:

A. **Assisting** teachers with a regional advisory centre for the promotion of environmental education through
  - accepting school groups for field work activities within the field studies centre and its environs.
  - providing teachers with the opportunity to participate with their classes in acquiring field techniques which can then be applied to their local environment.
  - assisting in planning environmental programmes and field trips.
  - assisting in developing school natural areas.
  - in-service training.

B. Assisting children to:

- gain first hand experience in a natural environment.
- acquire an understanding and an awareness of the functioning of natural systems.
- develop field skills in investigating and problem solving.
- gain insight into the effects of modifying natural systems.
- appreciate the need for, and methods involved with, managing environmental resources.

Since environmental education is interdisciplinary by nature, the general programmes offered at the centre involve an integrated approach drawing on traditional subject areas such as science, social studies, art, mathematics and music.

Teachers are encouraged to consult with the staff at the centre to devise a programme suitable to the needs and abilities of their pupils. In addition, a variety of programmes is available. This includes:

- habitats (e.g. sclerophyll forest, swamp)
- living and non-living components of a habitat (e.g. plants, animals, soils, rocks)
- past and present use of the environment (e.g. historical aspects, environmental degradation and resource management)
- interacting with the environment (e.g. sensory awareness, bushcraft, art, craft, drama, creative writing)

Facilities include classroom, store and office, wet weather shed, outdoor tables and seats, and barbecue fireplaces. Single day visits only are catered for.

9.12 BOURNDA

This centre is operated from premises at Jellat Jellat, between Bega and Tathra. Visits to the centre may be from one to four days in length; school groups may camp in the grounds of the centre at Jellat Jellat or use alternative accommodation in a hut located in open forest on a ridge overlooking Bournda Beach and Island. All sleeping and cooking equipment must be brought by the children.

The centre at Bournda provides an abundance of resources for study in the field:

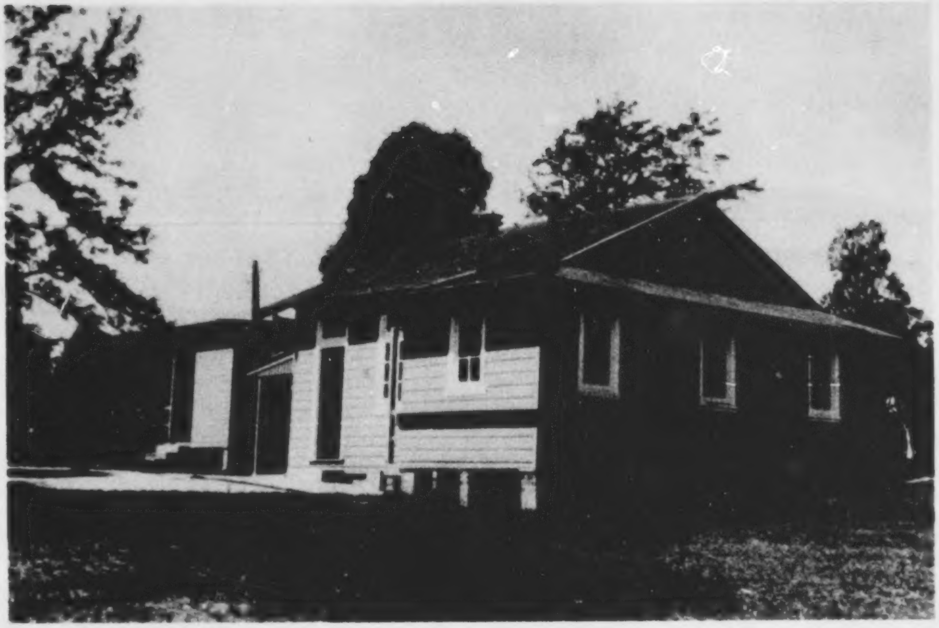
(a) **At Bournda**

5kms of coastline with undeveloped beaches, headlands and tied island. Nature trails through melaleuca forest, dry sclerophyllous forest, rain forest, wet sclerophyllous forest, and sand dunes, both vegetated and bare, and alongside saltwater lagoon and freshwater stream and pools.

Nature trail to Bournda Trigonometrical Survey Station.

(b) **Within 100kms of Jellat Jellat**

Three National Parks and many Nature Reserves. Many state forests, some with flora reserves. Farms — beef cattle, dairy, sheep, mixed enterprise, small crops.
Department of Agriculture Dairy Demonstration Farm.
Industries — fishing, saw milling, chip milling, cheese, butter, brick manufacture.
Towns — service centres for rural communities (e.g. Bega), residential/tourist (e.g. Tathra), service centres for exploitative land use and entrepot trade (e.g. Eden).
A wide variety of landforms and rock types.
Government departments — agriculture, water conservation and irrigation, fisheries, forestry, soil conservation.



The closed school at Jellat Jellat - the site of Bournda Field Studies Centre, New South Wales.

The water habitat for study at Longneck Lagoon, New South Wales

9.13 DORROUGHBY

This centre is located in the scenically attractive, Far North Coast region of New South Wales. It lies in the foothills of the largely rainforested mountain ranges that provide the divide between New South Wales and Queensland. The facilities include two dormitories, each to sleep 20 students, a lecture/film/dining room, outdoor gas barbecue and campfire seats, library, reading room, and basketball/volley ball/badminton courts. The ideal length of stay is three days and three nights. The following is a range of activities which could be considered by a teacher when programming a visit to the centre.

Environment

Nature rambles; trees of the rainforest; basic geology; bus transect to coast; coastal geomorphology; subtropical mixed farming; stream studies, life in freshwater stream; environmental education for slightly handicapped.

- Plant classification; local fauna; local wildflowers.
- Leaf litter study; insect study.
- Birds of the rainforest; reptiles of rainforest.
- Inter-relationships within a freshwater community.
- Soils; trends in agriculture.
- Settlement patterns.

Adventure

- Orienteering; survival course.
- Bushwalking; camping; hiking.
- Historical trek; the deep dark rainforest experience.
- Swimming in a rock pool; climbing Mt. Warning.

Personal and Social Development

- Values clarification.
- Self concept clarification.
- "Living together"; interpersonal relations.
- Problem solving and decision making.
- Sensitivity.

Crafts/Arts

- Environmental Art/Natural Materials.
- Creativity in the Field.
- Leather work.
- Nature's symphony.
- Photography.

9.14 BREWONGLE

It appears that Brewongle Field Studies Centre, Sackville North, is the only centre in Australia developed to cater for handicapped children. Although still in the process of adaptation, certain improvements to this closed school have already been specifically directed to the less mobile wheelchair children. Special showers have been constructed such that wheelchair children can be wheeled directly into and under the showers, i.e. they are large enough to accommodate the extra width of the wheelchairs. The shower fittings are not fixed, rather they come away from the wall and allow a child to be washed all over.

Due to the generosity of the Colo Lions Club, a special toilet block has been constructed to cater for these children. Supporting frames have been erected and curtains surround the cubicles. All the paths have been widened to the width of a wheelchair and the doors have also been extended in width.

In terms of environmental education, a sensory nature area is partly constructed with a pond (15' x 30') and some plants have been put in. The area has been fenced to keep other children out. It is an attempt to bring the bush to the children as the reasonably hilly terrain around the centre is currently inhibiting the mobility of the children.

A Schools Commission grant has been lodged and if it is successful the following will be be developed at the centre:

Ramps into the A-frame hut accommodation.
Ramp into the classroom.
Establishment of "sensory" plants in nature area.
Bird feeding bottles in nature area.
Construction of two small bridges over drainage canals.
Ramp into kitchen.

This project is certainly one which deserves the support of both the local community and Government grants to bring it to full potential.

9.2 YARRAHAPINNI (Private ownership)

This Centre, self-styled Ecology Centre and Holiday Camp, is on a unique beachfront property of 72 acres located near the north arm of the Macleay River between Kempsey and Nambucca Heads. The camp can accommodate 104 persons in bunk-houses containing 16 rooms to house from 2 to 10 persons. The area provides a magnificent location for field studies since the ecosystems are particularly pristine and capable of being managed to retain this characteristic.

Study programmes cover such topics as rainforest, wet and open forest, banana plantation, freshwater creek and lagoon, paperbark swamp, reefs, ocean beach, saltwater river, mangroves, stable and unstable sand dunes, flora and fauna. The habitats covered by the study programme are found on or within 800 metres of the camp.

During the school vacations, the educational programme is discontinued and the Centre becomes a family holiday camp. All groups are catered for all meals.

9.3 BUMBERRY (annexe to Dulwich High School)

Bumberry is located 30km from Parkes in the buildings of a small school closed in 1971. It was taken over by Dulwich High School in 1974 after submissions from the then headmaster, Mr. W. Miles. Dulwich High organises 6-10 trips a year for its students and other schools use it also.

The school population is 75% migrant and the staff sees the centre more as an opportunity for arousing interest and developing social skills by means of an unstructured approach. Senior groups spend more time in academic studies.

From the school there is access to the Parkes Telescope, the Lachlan Village, dams, hikes over the mountains to quarry sites, local farms, and the landscape of the west.

The centre consists of boys' and girls' sleeping quarters (mattresses on the floor), a storeroom off each sleeping quarters, and a washroom in between. Cooking facilities are all outdoors. With available finance there is plenty of scope to upgrade the facilities e.g. lino floor coverings and perhaps some cement slabs around the outdoor cooking areas, but here exists an opportunity for city children to have a real outback experience, perhaps their first environmental encounter.

9.4 THE CROMMELIN BIOLOGICAL FIELD STATION

About sixty-five miles north of Sydney, at Pearl Beach in the central coast area, is the Crommelin Biological Field Station of the University of Sydney. No one who goes there ever calls it by that very imposing title — it is universally known as "Warrah", an aboriginal word meaning "a wide view" or "seen from a long way". Warrah consists of two houses, a tiny cottage, and approximately seven acres of land surrounded on three sides by the Brisbane Waters National Park.

In 1946, Miss Minard Crommelin, M.B.E., gave this property to the University of Sydney, together with many of her personal possessions, some money and share certificates, "these to be devoted to the purpose of seeing established thereon in perpetuity a biological and natural field station for research into and for the promotion of the study and the improvement and preservation of the native flora and protection of native fauna".

Since that time some thousands of biology students have stayed at Warrah and studied the plants and animals of the area. In spite of crowded facilities and a makeshift laboratory, former students often recall the few days at Warrah as their most pleasurable university experience. Plans are in hand for a proper laboratory to be built, and hopes are high that funds will become available.

9.5 CAMP KNOX (Annexe to Knox Grammar School).

Forty minutes by ferry from Brooklyn is Camp Knox, an annexe of Knox Grammar School staffed by a full-time camp director and camp manager. The camp has been in operation since 1974 and consists of two cottages, bunkhouses for the boys (to house 60), amenities block, and a fully-covered dining/recreation area with an adjoining kitchen.

Year 8 boys spend one week a year at the camp in seven classes of 30, one class at a time. Year 10 boys spend 11 days at the camp in third term. Both groups undertake an academic recreation programme which includes fieldwork in various aspects of biology, geography, geology and history.

This year (1978) for the first time a group of Year 11 boys from the lower academic stream are living in at the camp for the whole year, undertaking a special course under the supervision of two teachers from the school. It is intended to extend this to include such students of both years 11 and 12.

9.6 CHAKOLA

Chakola is a residential centre situated in an area of superb unspoiled naturalness in the Kangaroo Valley, south of Sydney. The 80 acres is a gazetted wildlife refuge providing sanctuary for possums, wallabies, wombats, echidna, and supporting a large variety of birds, including the lyrebird, from which "Chakola" derives its name. Platypus have been sighted on the river bank.

RAVENSDALE PROJECT

Schools Commission money bought this bus for the Ravensdale Centre in New South Wales.

Part of the coastal diversity available at Yarrahapinni, Kempsey, New South Wales.

Chakola comprises a main recreation/dining room; an upstairs gallery; kitchen; shower and toilet facilities — all these in a central building. Sleeping quarters are in five 8-berth timber lodges plus two 4-berth annexes. Maximum occupancy is thus 48 people.

This centre, built in 1965, is an expression of the work of Ausventure, which introduced walking holidays in 1966 under the guidance and direction of Warwick and Antonia Deacock.

Chakola, a business venture, will be leased from Ausventure for the next five years by Derek Lucas and his wife Caroline, who will continue the work in recreation and environmental awareness they commenced there some years ago. Schools, universities, groups and families will find here the potential to continue studies or just enjoy the naturalness of the area. During all school holidays, Derek and Caroline, with a hand-picked team of counsellors, supervise children in groups of up to 40, for a week's activities which include camping, canoeing, caving, hiking, fishing, archery, swimming, nature study, painting, play acting, pottery, puppetry, music, modelling and indoor games.

Chakola is more than a leisure centre, and while its prime objective is not to mount a programme of environmental education, the interests of the staff and the unique natural resources of the area cannot but help engender in its visitors, young and old alike, a respect for the environment and a desire to study it more and play a part in its conservation.

9.7 THE RAVENSDALE PROJECT

In the Yarramalong Valley the Ravensdale closed school has been developed as a field campsite for all Central Coast High Schools. Mr. Lance Godwin on the staff of Henry Kendall High School has been allocated one day a week to act as co-ordinator. Parents, friends and pupils have worked at weekends to build a toilet block, develop the grounds and, with the help of Forestry officers, lay down trails in the adjacent Wattagan State Forest. Money from the Schools Commission was spent on a bus, camping equipment, barbecues and a shelter shed. Since 1976 the site has operated with an average of 50 school visits a year. The surrounding environment includes rich dairying land, a permanent creek, and Wattagan State Forest with a variety of forest ecosystems available for study.

9.8 YERRANDERIE HISTORIC VILLAGE

Yerranderie, high up in the Burragorang Valley, in the heart of the Warragamba catchment area, has been almost totally deserted for the past 50 years, just the ghost of a town built around what was, at the turn of the century, probably Australia's richest silver mine.

But to-day, in the old post office in Yerranderie's main street, a Sydney architect named Val Lhuede has laid the basis for a field studies centre which, she says, is to be the buffer zone between the wilderness area and the public area. Already Macquarie University Earth Sciences Department have used the site for the last five years. Miss Lhuede, who operates now as the Field Staff Officer, is sole owner of 468 hectares, including the village itself, and sees the centre in the future as a centre for the total community and an Outdoor University with on-site staff. Studies include Wilderness education, geology, geomorphology, human geography, mammal and bird studies, geobotany, history, and vegetation studies.

9.9 MILLAMURRA FIELD STUDIES CENTRE

In 1977, under the initiative of Ken Porter, a member of staff, Epping Boys' High School received a grant from the Schools Commission to establish a field studies centre in the grounds of the school. Year 9 boys under the supervision of a teacher started building the room in 1978 and finished it as Year 10 students in 1979.

This centre (Millamurra of "many eyes") appears to be the only school-based field studies centre in Australia. Another first for the school, ensuring that the centre will be used, is a course in Environmental Studies for all Year 7 boys commencing in 1980.

It is planned that Millamurra will also be available to all local primary schools.

9.10 CENTRES OF THE DEPARTMENT OF SPORT AND RECREATION:

The Sport and Recreation Centres in New South Wales have tremendous potential as vehicles for the promotion of environmental education. In fact, the first outdoor centre in New South Wales with a programme of field studies was the Broken Bay National Fitness Camp (as the centres were first called in the 1940's). From that time until the present, the field studies component of the centres' programmes has been very much a function of the interest and abilities of the centre staff, and unfortunately, skills in the promotion of environmental education are not in evidence at the majority of centres.

Of the ten centres in operation at the present time, six are classified as schools for specific purposes and are staffed by teachers from the Department of Education. These centres are Lake Ainsworth, Lake Keepit, Myuna Bay, Point Wolstoncroft, Broken Bay (all primary), and Lake Jindabyne (senior secondary). The other four, Narrabeen, Lake Burrendong, Borambola (all primary) and Little Wobby (junior secondary) are minimally staffed by personnel employed by the Department of Sport and Recreation.

The programmes of the primary centres visited in 1980 do not cater for environmental education at all, and the small amount of natural science covered is disappointing with respect to the potential of each site. It is conceded by some centre staff that programmes are 20 years out of date; one camp director believes the time has come to review aims and objectives and to explore the best ways of achieving them. While it is agreed that the basic goal of a Sport and Recreation Centre is the social and recreation components, it can be argued that with the particular assets these centres possess, at least 20% of the programme ccould be directed into environmental education. Borambola has a reasonably diverse environment — billabong, open woodland, Tarcutta creek with river red gums, farmland, open grassland — and yet here is the programm offered to almost every school during term time for a 5 day visit:

Monday
Camp Entry
Lodge Allocation
Banking
Orientation
Bushtrack
Boomerangs
Thursday
Horse riding
Riflery

Tuesday
Canoeing
Craft
Wednesday
Archery 1
Dance
Cookout
Friday
Orienteering
Archery 2

With some schools this programme was varied to include a bivouac. Borambola is an example of a 5 day centre which caters for whole-school camping, and these centres do have their problems. Firstly, five days is considered by some to be too short a time in which to develop an adequate programme; secondly, the programme is intended to be developed by the visiting school, but in 99% of all visits, when the Director rings in advance to ask for the programme, the school replies, "We'll leave it up to you". Supervision of activities must be covered in part by the visiting staff (only two centre staff at 5 day centres), and activities in environmental education would need to be simple and well documented if a visiting teacher, inexperienced in the area, were to be of assistance.

A permanent staff member at Lake Burrendong admitted that what is done there in the area of environmental studies is only incidental and that is done by the two permanent staff while in free time, or just in answer to children's questions. Lake Burrendong has excellent facilities — a large, well-stocked library and a museum classroom which would be an excellent place to set up tables with 6-8 binocular microscopes to encourage observation of things found in the field.

At Point Wolstoncroft, environmental studies are programmed, and education about the environment is incidental in all camp activities. The centre's objectives include the development of awareness and appreciation of the environment; environmental issues are often discussed, for example, the impact of the Vales Point Powerstation, littering by the boat visitors, etc. But in spite of these commendable efforts, Mr. Gordon Harvey, the Principal, still believes that environmental education could be developed to a greater extent in his centre. But the problem, he says, is the development of background knowledge by the centre teachers. What is needed, he believes, is an environmental handbook for his centre written by someone with a certain degree of expertise.

It is also unfortunate that this 10 day visit, with its potential for a lasting impact, is an experience in isolation from the school curriculum and school programme. If an environmental handbook was developed for this centre, a leaflet should also be developed to be sent to schools with suggestions for a follow-up programme based on the environmental encounters experienced at the centre.

Some excellent work in environmental education is being done at the Lake Jindabyne Centre with students mainly from Year 11. In a 7 day stay, 4½ days would be allocated to academic work and 1½ to recreation, which includes orienteering. The academic programme is an integrated approach to the environment, carefully balanced in terms of difficulty and nature of the activity, based almost completely on student observation and inference, and tied together by looking at man's impact on the environment. It is environmental education in the true sense of the word, and Jindabyne Centre certainly fulfills all the criteria for a "field studies centre". With several different schools in camp, and children with different subject needs, the programme is not related directly to any one particular syllabus — each child has a total look at the environment of the area and can build up a background of environmental encounters to draw from in the future.

A good measure of the success at Jindabyne is undoubtedly due to the qualified staff who have expertise in the field, an ability to relate the parts to the whole, and confidence in the quality of the programme they are teaching. It is unrealistic to expect the primary trained teachers who staff most of the other centres to have the same confidence and ability in environmental studies as the secondary trained teachers.

The attitude of visiting schools to the Jindabyne programme is interesting. The staff of North Sydney Boys' High said they would not be interested in a programme which was different from the one operating at present, such as increasing the recreation component. Certain schools, they pointed out, would probably not appreciate the economic aspect of increasing the recreation component. Moreover, in schools where the Principal insists on a justification of the time spent away, the present programme more than settles his doubts. One visiting teacher from Sydney Girls' High said the programme appealed because of its variety and integrated approach. From comments made by teachers it appears that teachers and students who come to Jindabyne for the winter programme need some sort of preparation in order to accept the 3 day academic programme as being a worthwhile experience also.

Borambola had made a gesture to a recognition of the environment — there were posters from the National Parks and Wildlife Service in the dining/recreation hall, natural history books in the library, a chart of photographs of local birds, posters on the platypus, and a study corner with two binocular microscopes. Plans have been made to develop a nature trail in 1980, a trail with marked stations, together with written handouts for the visiting teachers. In a primary camp such as this, a nature room/laboratory is so much more necessary than at Jindabyne where students come from secondary schools with laboratories. In a situation where the outdoors are so much a part of the everyday experience, what better time than to include observation studies such as bird watching (with binoculars) and looking at the miniworld with binocular microscopes (which are not part of normal primary equipment).

Sport and Recreation Centres have a marvellous opportunity to help in the development of environmental awareness in children —

- sites with environmental potential
- no competition from other subjects
- time to allow children to be outdoors
- facilities in which space can always be found for a study corner

The major goal need only be to inculcate a new *awareness*, by developing the skills of *observation* through the use of all the *senses*. *Sensory awareness experiences* should be built into the camp programmes.

The Sport and Recreation Centres are available to the general community when schools are not in residence. However, the community groups are basically using the centres for recreation; Jindabyne is a source of cheap accommodation, especially in the ski season, and so is catering for low socio-economic groups. At most centres, community groups who come in at week-ends develop their own programmes but can ask for help if needed.

During the school holidays, Vacation Camping Programmes are supervised by Counsellors. In order to qualify as a Counsellor, an applicant must achieve the attainment level of at least 12 out of 19 programme areas. The criteria laid down for Natural Science are:

> "Applicants should clearly and satisfactorily demonstrate a thorough knowledge of the core aspects of — flora, fauna, geology, geography, marine biology, weather patterns".

This programme outline is too general and not specific enough to the young counsellor — it must be off-putting and rather formidable. It should include more general environmental awareness skills.

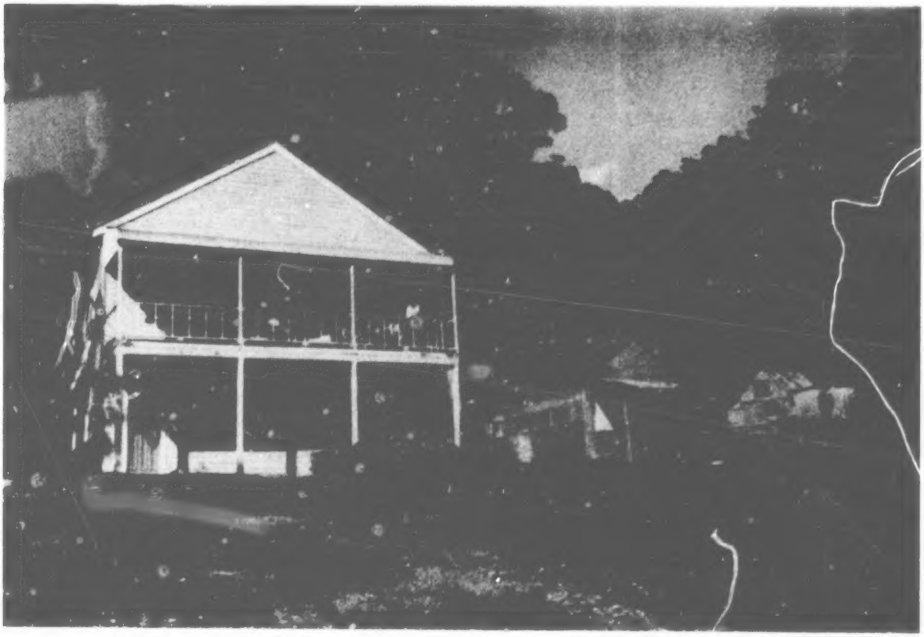
At Burrendong, during a Vacation Camp, two counsellors in training came to the Director and made excuses about taking their group on a scheduled Nature Walk. It was obvious they lacked confidence to lead such an activity.

But the handout on training doesn't give enough guidelines — a pamphlet with desired learning outcomes should be prepared with greater emphasis on general environmental awareness skills than on an academic knowledge of names of flora and fauna. A basic knowledge of the principles of ecology, which could be applied to any environment (and therefore to any centre) would be desirable.

During 1979, out of **six** training programme sessions for Counsellors, which covered a total of 26 attainment areas, Natural Science was offered only **once** (at Narrabeen by Mr. C. Raper). This of course is due to the fact that Mr. Raper is probably the only centre Director who feels confident enough himself in this area.

Sport and Recreation Centres are potential vehicles for developing a greater awareness of the environment. With choice sites and a captive audience, staff could build up a bank of environmental experience for children to take back to school and form the basis of future programmes. It is recommended that:

1. a policy be developed on the inclusion of environmental education in centre programmes;
2. a handbook on environmental activities be developed for each primary centre;
3. an inservice course be held initially to introduce the handbook;
4. better facilities for developing skills in observation be planned, such as an area in which at least six binocular microscopes can be set up and their use supervised at set times;
5. that some thought be given to the training of Counsellors in the area of Natural Science.



The old Post Office at Yerranderie, New South Wales, the site for a field studies centre.

TABLE 9.1
For Key see Table - 3.41, 3.42, 3.43

Centre	Authority	Resid. or Day	Staff-ing	Pro-grammes	Major Ecosystems
(1) Arrawarra Field Station (Coff's Harbour) 1958	U.N.E. B	Resid.	C	3	Coastal
(2) Awabakal (Newcastle) 1976	A	Day	A	2	Forest, coast, lagoon, urban
(3) Brewongle (Sackville North) 1978	A	Resid.	A	2	Dry forest, river
(4) Bournda (Bega) 1975	A	Resid.	A	2	Dry forest, wet forest, lagoon, coast, creek, rural, timber logging, urban
(5) Dorroughby (Lismore) 1977	A	Resid.	A	2	Rainforest, farms, creek, geological sites, bus to town, saw mills, coast, sugar cane & tropical fruit farms, Border Ranges, Mt. Warning
(6) Longneck (Pitt Town) 1978	A	Day	A	2	Dry forest, lagoon, rural, historic town
(7) Muogamarra (Cowan) 1973	A	Day	A	2	Dry forest, estuary, creek, aboriginal
(8) Thalgarrah (Armidale) 1976	A	Resid.	A	2	Creek, dams, open woodland farms
9. Royal (Audley) 1978	A	Day	A	2	Coast, dry forest, wet forest heath, creek
(10) Wambangalang (Dubbo) 1976	A	Resid.	A	2	Farms, creek, open forest
(11) Wirrimbirra (Bargo) 1973	A	Resid.	A	2	Dry forest, creek, historical sites, plant nursery, urban studies

(12)	Borambola 1971 (Wagga Wagga)	E	Resid.	A	4	Farm, billabong, creek, open woodland
(13)	Broken Bay 1941 (Hawkesbury River)	E	Resid.	A	4	Coast, dry forest
(14)	Bumberry 1974 (Parkes)	F(a) Dulwich High	Resid.	C	4	Rural, dams, farms, open woodland
(15)	Lake Burrendong 1976 (Wellington)	E	Resid.	A	4	Inland lake, farms, historic mining town, creeks, open woodland
(16)	Chakola 1965 (Kangaroo Valley)	C (Private)	Resid.	A	4	Creek, river, dry forest, rural
(17)	Jindabyne 1971 (via Cooma)	E	Resid.	A	4	Alpine area, lake, farms, geological sites
(18)	Lake Ainsworth (Ballina) 1944	E	Resid.	A	4	Lake, coast, dry forest, coastal scrub
(19)	Lake Keepit 1962 (Tamworth)	E	Resid.	A	4	Water studies, dry forest
(20)	Little Wobby 1970 (Hawkesbury River)	E	Resid.	A	4	Coast, dry forest
(21)	Myuna Bay 1954 Lake Macquarie)	E	Resid.	A	4	Lake, dry forest
(22)	Narrabeen Lakes 1950	E	Resid.	A	4	Forest, coast, estuary
(23)	Newholme (Armidale) 1973	B	Day	C.D.	3	Dry forest, open woodland, rural, creeks U.N.E.

(24)	Pappinbarra (Port Macquarie) 1976	D (Community Trust)	Resid.	C	3,2	Dry forest, rainforest, creeks
(25)	Crommelin Biological Research (Pearl Beach) 1946	B (Sydney University)	Resid.	C.D.	3	Coast, creek, lagoon, dry forest
(26)	Point Wolstoncroft 1942 (Lake Macquarie)	E	Resid.	A	4	Lake, dry forest, island
(27)	Smiths Lake 1960	B (University of N.S.W.)	Resid.	C.D.	3	Lake, coast, dry forest, creeks, swamps
(28)	Yarrawood Conference Centre 1946	D (Sydney Teachers' College)	Resid.	C.D.	4,3	River, dry forest, rural
(29)	Yerranderie Village (Via Oberon 1974	C (private)	Resid.	B	4,3,2	Geological sites, mines, dry forests, creeks, historic town
(30)	Yarrahapinni (Kempsey) 1976	C (Private)	Resid.	A	4,3,2	Coast, mangroves, lagoon, rainforest, dry forest, rural
(31)	Neal Lodge (Macksville) 1975	C (Private)	Resid.	A	4,3,2	Coast, creek, rainforest, river, farms, urban areas
(32)	Tiona Park (Via Forster) 1977	C (Private)	Resid.	A	4,3,2	Coast, woodland, heath, rainforest, Bus to Myall Lakes, sand mining, Seal Rocks, fishing village, urban studies oyster farms, beef & dairy farms

(33)	Camp Knox (Hawkesbury River) 1974	F(b) (Knox Grammar)	Resid.	A.D.	4,3,2	Creek, river, dry forest, historic settlements, historic settlements, Aborigines
(34)	Armidale C.A.E. Centre for Natural Science & Mathematics Education 1980	B on Campus	Day	C	3	Dam, creek, planted natives (old farm)
(35)	Ravensdale 1976 (Central Coast)	F(a) Henry Kendall High	Resid.	B	4,3,2	Dairy farms, creek, State Forest
(36)	Canberra C.A.E. (Jervis Bay) 1974	B (Canberra C.A.E.)	Resid.	C	3	Heath, swamp, estuary, coast, dry forest
(37)	Millamurra (1979) (in school grounds)	F(a) Epping Boys' High	Day	A	2	Creek, dry forest
(38)	Wedderburn Outdoor Resources Centre (1979)	A	Day	B	2	Creek, dry forest

CLOSED SCHOOLS FOR OUTDOOR EDUCATION

1. Cladulla — Shalvey High School
2. Grose Wold (North Richmond) — Whalan High
3. Blaxland's Ridge (Windsor) — Mt. Druitt
4. Stewart's Brook — Muswellbrook High
5. Martinsville — Morisset High
6. Gouldsville — Singleton Public
7. Wooyung — Mullumbimby High
8. Cascade — Dorrigo High and Primary
9. Bungonia — Goulburn schools
10. Elmwood (via Moss Vale) — Warrawong High
11. Nerriga — Warilla High
12. Ravensdale — Gosford district schools
13. Bumberry (Parkes) — Dulwich High

N.B. The Riverina Region has no field studies centres and no plans to develop any.

COVERINGS
TEA HOUSE

Beechworth, Victoria - a town with great diversity of study sites for environmental education.

Faraday closed school in Victoria - staff allocated one day a week.

CHAPTER 10 — FIELD STUDIES CENTRES IN VICTORIA:

According to the strict definition of a field studies centre, it would be correct to say that Victoria at the present has no field studies centres, except perhaps for the newly established private venture at Dunkeld, the Grampians Environmental Studies Centre, and the Education Department centre, Whipstick, in the Bendigo inspectorate. But environmental programmes are in operation in a number of places which vary from private ventures like Macropus Park near Kerang, to College Camps (Noojee Outdoor Education Centre) and Outdoor Education Camps like Somers. Quite frequently the environmental education programmes are coupled with recreation pursuits, and activities geared to social development. The Environmental Studies Association of Victoria plans to build the ideal field studies centre at Glenewart near Launching Place, a small township about 65km east of Melbourne, in the upper Yarra area. This is to be a centre for the whole community, and one based on sound environmental principles.

Crown land has been set aside by the Land Conservation Council as Education Areas, but by the end of 1979 no development had occurred. The Education Department appears to be uninterested, mainly because of lack of finance, since some education areas would need a centre on the site, and all areas would need some sort of resource materials provided by experienced teachers before schools could use them adequately as field sites. The concept of education areas however is a good one because there would be no constraints operating as in National Parks.

10.1 A FIELD STUDIES CENTRE:

The Whipstick Environment Centre at Bendigo was the first field studies centre in Victoria. Peter Pritchard, who works for School Forestry, made a submission to the Schools Commission in 1974 to use the local closed school. Work started in 1977, a mud-brick toilet block was built, and the centre officially opened in November, 1978, as the only centre of its kind in Victoria. Peter saw the centre originally as a total community concept but so far, with a full-time Education Department teacher, it only operates for school children five days a week. Future plans include the construction of mud brick cottages (to be used instead of tents), a wetland site, a reptile area and a display to show the history of farming practices. The centre is only one mile from a section of Whipstick mallee, the closest mallee to Melbourne. Historically it is an interesting farming area; ironbark forest and box forest are close by, and historical urban studies of the goldrush era are possible inclusions in a study programme. Bird life is prolific. Much work remains to be done but the site has potential as a rural-semi-wilderness experience.

10.2 PROPOSED CENTRES:

10.21 Delaney Environmental Education Centre - Beechworth

This centre is still in the development stage with school groups being accepted in 1979 in what was termed a "pilot year". The centre is based in the Brigidine Convent at Beechworth, now a closed school, and it is clear that tremendous potential exists for this site. Some of its advantages are:

1. A great diversity of studies —
    - (a) historical studies — gold town, Chinese population.
    - (b) geology and mining
    - (c) interesting planning possibilities — rural growth centres
    - (d) rural land — tobacco, orchards, cattle
    - (e) vegetation studies — open forests, radiata pine, subalpine, plant successions.
    - (f) landforms — geography and land-use
    - (g) urban study
        - (i) compact historic town
        - (ii) Albury-Wodonga complex
        - (iii) hydro-electric scheme at Kiewa
    - (h) ecological studies
    - (i) sociological studies — an interesting social structure centres around three large institutions, a mental hospital (500 employees), a gaol, and an Old People's Home
2. A building is already there — a one-time boarding school with residential facilities to provide cheap accommodation.
3. There is great interest about the centre among the local residents and many are willing to provide expertise in a number of areas.
4. Transport is good — rail to Chiltern, then bus to Beechworth ($4.50 return on the train, from Melbourne, and $2 on the bus).
5. There would be no problems with overuse because the area is large enough to have "rest" areas, and diverse enough to have alternative programmes.
6. The area can provide a number of issues for study and so help the development of skills in problem-solving and decision-making, for example:
    - (a) what is an acceptable population density?
    - (b) demography - the road to Albury
    - (c) sociological problems — three large institutions and no industry
    - (d) transport — inter and intra
7. Potential as a good recreation area would also recommend the centre to family groups at week-ends and in holiday time. Possibilities include:
    - (a) horse riding
    - (b) many interesting and attractive walks
    - (c) orienteering
    - (d) cross-country running
    - (e) pottery, art, photography
    - (f) overnight camping

Sister Alexia, the co-ordinator, planned to establish a Planning Committee in the second half of 1979, and to apply for a Government Grant in 1980 (to cover such things as the purchase of a mini-bus).

10.22 Glenewart

The property, Glenewart, was purchased in 1974 by the Victorian Government as public land for the purpose of environmental education, and at the time the Government indicated that it saw a role for the Environmental Studies Association of Victoria in that development. Subsequently the ESAV prepared a Master Plan for the property and, following discussions with the Premier, was given $8,000 in 1978/79 to prepare final schematics for a residential field studies centre on the site. ESAV employed the P.W.D. to work on the schematics, and these were presented to the Premier in April 1979 for his further consideration.

The mud-brick ablution block at Whipstick Bendigo, Victoria.

Making mud bricks for cabins at Whipstick Centre, Bendigo, Victoria.

A feature of the design of the centre is the way in which it translates recommendations of the 'Glenewart' Master Plan Development Report into a modern, functional building which directly demonstrates sound building and conservation principles.

The facilities to be provided are in 4 major zones or categories: educational, recreational, residential (participants), and staff accommodation (e.g. for the warden). Broadly, these are located in zones separated by the several levels which make up the building, each of which is related as closely as possible to the ground.

(a) **education** levels are on the lowest level with the major spaces to the north (together with the public entry and display area);
(b) **recreation** levels are in the middle and over (a);
(c) **service** areas separate the recreation and
(d) **sleeping** areas, the latter being arranged in two blocks of two stories.

'Casual' visitors can pass through certain parts of the building and its environs to view displays and observe various demonstration systems at work.

A feature of the design of the building is the incorporation of alternative systems related not only to energy conservation but also use of water and recycling wastes, etc. Active energy alternative systems include solar collectors, a heat exchange system, slow combustion wood-fired stoves, wind-powered generators, use of L.P. gas, and a sewerage treatment system which will provide methane gas. Some of these are primarily aimed at meeting demonstration (educational) needs.

On November 27, 1979, a small deputation met with Mr. Hamer to discuss the further development of Glenewart. Mr. Hamer clearly recognised the value of the proposal and its consistency with the objectives of the development of Glenewart. However, he pointed out that Government money was limited and that the present policy of the Victorian Government was that no new projects should be initiated at present. Clearly the Treasurer was unable at this stage to make a recommendation approving money for the initiation of the built-centre. The total costs of the built-centre at 1979 rates was estimated to be in the vicinity of $960.000.

Dr. Malcolm Calder, ESAV President 1978-1979, wrote in the ESAV Newsletter, December, 1979 —

"I believe the objective of ESAV must be to establish, as soon as possible, a world-class environment studies centre as a pilot example of what is needed and what can be achieved. I hope, and believe, the Government of Victoria recognises the value of our work and sees with us this need. I believe that the Glenewart proposal is recognised as the beacon on the hill, but which is too costly in the present economic climate; there is no suggestion that it has been shelved. Mr. Hamer, at our request, is now considering alternatives which might enable us to achieve the stated objective, and we are hoping to have further discussions with him at an early date".

10.3 VICTORIAN SCHOOL CAMPS:

The Victorian School Camps Branch of the Education Department claims to have the biggest turnover in outdoor education in the world. Up to 1,000 schools could be using school camps.

Fully staffed school camps administered by the Department of Education are the three camps, Somers, Rubicon, and Bogong. Other school camps are the responsibility of one or more individual schools, the total number being 65 used by primary and high schools, and 23 used by technical schools. The Acting Supervisor of School Camps Mr. Penhall said, at an interview in 1979, that there is only a limited demand from teachers for field studies centres because of the established camping programme. Every child in the State visits a camp at least twice in primary and three times in secondary, moving around to different sites. A range of habitats does exist among the camps, and if the teachers so wished, a systematic plan of varied visits could be drawn up by any school. However, Mr. Penhall did add that only one or two schools use their camp sites for well-developed environmental programmes, and he deplored the fact that the majority have only limited environmental activities. The reason is due to the limited experience of teachers in this area, and the need in Victoria appears to be not a network of field studies centres, but finance for:

1. Inservice
2. Facilities to upgrade the camps, e.g. equipment, and laboratory-type rooms.

School Forestry, School Camps, and Gould League and Physical Education Branch all play an advisory role in outdoor education, but perhaps only the Gould League is giving direct help in environmental programmes. The recommendation for Victoria is for the conversion of some existing camps to centres with laboratory facilities to act as inservice centres.

CHAPTER 11 — FIELD STUDY CENTRES IN TASMANIA:

11.1 OUTDOOR EDUCATION IN TASMANIAN SCHOOLS

Many individuals in Tasmania during March, 1980, contributed to the picture presented in this chapter. Acknowledgement is given to Tony McKenny, Consultant in Division of Recreation for the Northwest Region, who made available his notes on the situation as he sees it, and extracts from these are included below.

Rather than environmental education, the term "Outdoor Education" is now used commonly in Tasmanian schools and colleges, but it is apparent that different people mean different things by it, and also that some who use it are not really at all certain what it means. It is commonly referred to as a method, as a subject, as a study of the natural environment, as camping and bushwalking or as an extension of Physical Education.

The Committee of Outdoor Education Experiences in Tasmania (COOEE) has avoided trying to pigeonhole the term too neatly. They see it as "a portmanteau term embracing a diversity of activities, attitutes and educational objectives" (COOEE 1977). At present these are seen to comprise two main areas of endeavour; adventure activities and field studies, although the two of them frequently overlap in school programmes. Many teachers would add to them Social Education, particularly in reference to residential programmes, although Lambert (1979) in a recent analysis of outdoor education in Tasmania stated that:

> "Social Education, as part of outdoor education, is at a fairly rudimentary stage of development; it does not seem to rest on any widely understood knowledge base and in terms of teaching skills, it must be said that most teachers possess only intuitive skills and those that they have derived from experience".

Prior to 1974 most of the developments in field studies were very much at grass-roots level involving individual teachers and schools, but in that year the Education Department published the influential report from COOEE. This report not only outlined the philosophical background to Outdoor Education and the types of resources that would be needed, but also indicated the future role of the Education Department. In particular this was seen as facilitative and supportive but not directive, leaving the schools to decide their own objectives and programmes. This role has subsequently been reaffirmed and further defined in COOEE's second publication, the Handbook on Outdoor Education (COOEE 1978) which contains guidelines for schools in the development of field study programmes.

Some selected recommendations from the 1974 COOEE report are as follows:-

1. **General**

1.1 Education programmes outside the classroom should be an integral part of the education of every child.

1.2 The Department should encourage and support the development by schools, of outdoor educational programs.

2. **Field Study Centres**

2.1 A permanent field study centre, appropriately staffed and equipped, should be developed immediately.

2.2 Immediate investigation of the number, location and acquisition of sites for field study centres should be undertaken.

2.3 A field study centre based on a city environment should be given a high priority.

By 1980, only 7.1 had been acted upon (Waddamana).

In the 1978 publication there were no statements on the development of the field study centres but rather guidelines for field studies, a more appropriate inclusion, of course, for a Handbook on Outdoor Education. A paragraph of particular interest in the section, Relationship with Total Curriculum, indicates that thinking among the committee members was evolving towards the broad goals of environmental education.

> "Active partipation by children in local planning, conservation and decisions about other questions which help to shape the local environment should be encouraged from an early age. Children should be given opportunities to do more than observe, record and analyse. They should be made aware of the need to be involved in the active conservation of what is valuable in their environment and in the improvement of the quality of the environment in which they live".

A second major internal stimulus during the period has been the Schools Commission Innovations Programme which has funded a wide variety of projects. These have ranged from the appointment of an Outdoor Mathematics Consultant and the provision of staff at Field Centres, to the building of schools' own facilities, such as those developed by Riverside, Scottsdale and Burnie High Schools. The Innovations Committee has also helped in the development of school grounds as learning resources and has, during 1978-79, funded the Marine Studies Centre at Woodbridge.

Some criticism has been levelled at the Schools Commission for this type of funding on the grounds that it encourages piece-meal development with no long-term responsibility. It can, of course, be argued in reply that, by providing the necessary funds, it is in fact reinforcing the stated intention of the Department that schools should be encouraged to develop their own objectives or programmes.

1975 saw another important publication, the report of the Committee of Environmental Education, which has done much to stimulate curriculum development, particularly in the Secondary Schools. That year also saw the formation of the Division of Recreation which has been given executive responsibility for Outdoor Education in the Department, acting on the advice of COOEE.

It is not apparent, to the outsider at least, whether Tasmania has an official policy on environmental education, or field study centres or even in outdoor education. However, statements, or recommendations, do exist, that may bc considered as policy, depending on your point of view towards the committee producing the statement.

In March 1977, Secondary Education in Tasmania, a Review for the Education Department by the Committee on Secondary Education, included the following statements:

> "Special interests such as environmental education should be developed within the general program rather than be picked out as separate fields of study".
>
> "It is the view of the Committee that subjects 'such as environmental education could, and should, be developed within the framework of the general program rather than picked out as separate curriculum areas. Students should be encouraged to view the environment from an objective point of view; then, on the basis of observed fact and accumulated data, proceed to other levels of analysis, make value judgments and consider social effects".

Primary Education in Tasmania, A Review for the Education Department by the Committee on Primary Education, was released in March, 1980. A statement on Outdoor Education fails to lift field studies beyond the "Science Table", and a "nature study" emphasis, and there is no mention of environmental education, either overt or covert.

However, as a result of all these influences, either directly or indirectly, the 1970's saw a period of rapid growth in field studies with the development of new facilities and resources, an increasing involvment of staff and a massive rise in the numbers of Primary and Secondary Schools undertaking Outdoor Education programmes. A survey in 1973 showed that possibly 25% of the secondary schools for example, in the State undertook some form of residential programme; by 1979 that had risen to 66% involving about 14,000 secondary pupils. Of the programmes undertaken by these schools, about 40% were what may be classified as field study based.

11.2 FIELD STUDY CENTRES:

Tasmania, like Queensland, prefers the title "Field Study Centre" to "Field Studies Centre".

Table 11.1 lists the major centres, although it should be noted that as yet few of them are equipped specifically for field teaching.

The Division of Recreation has only one officially designated field study centre, Waddamana, although a number of its recreation camps are used for field study - type programmes.

The other Education Department Field Centre is the Hagley Environment Centre, which opened in 1976 in the grounds of the Hagley Primary School, North-West of Launceston. The Centre uses the resources and residential facilities of what was formerly a farm school and can cater for up to 65 Primary pupils and their teachers. Activities are based mainly on the 62 hectares of farm land administered by the school, but groups also range further to nearby natural bushland, and old township of Hagley or even to Launceston and the Mole Creek Caves.

The only other specialist residential centres have been developed by individual schools. The Mount Cameron Centre in the far North-East of the State, for example, was built by Scottsdale High School with assistance and advice from many community groups. Other centres, such as Bruny Island, Storey's Creek and Guildford, offer, or will offer, similar facilities to Mount Cameron but it is interesting to note that the Department, while not forbidding the development of such projects, has made it quite clear that in this respect it can in no way support the school's initiative.

The Department has two day-visit facilities, both of which are run from the Southern Regional Office. The first, the Molesworth Environment Centre, was opened in 1977 and is designed specifically for primary children and their teachers from the Hobart-New Norfolk area.

The other, which opened in 1979, is the Marine Studies Centre which, although developed with an Innovations grant, has now been taken over by the Department.

11.21 MARINE STUDIES CENTRE (Woodbridge)

Unique among the field studies centres in Australia is the Marine Studies Centre at Woodbridge, south of Hobart, opened in April 1979.

The Marine Studies Centre is a new concept in education funded by the Innovations Programme of the Schools Commission. The centre provides a base for a day's tuition in Marine Studies for groups of secondary students, with their teacher.

The project has involved converting a former scallop splitting shed, situated on the foreshore, into a fully-equipped marine laboratory, aquarium room, fishing gear workshop and lunch area. A jetty has also been constructed to facilitate mooring of boats, and as a support structure for the aquarium salt water feed pipe.

Since its original funding, the project has received substantial assistance and co-operation from the local community, council, business houses and State Government. This support reflects the tremendous interest in fishing and fisheries development in Tasmania at present. Through the Fisheries Development Authority, the State Government has generously made available the 15-metre F.R.V. Penghana, together with master, maintenance and running costs. The State Education Department also provided additional funding for a 5.25 metre aluminium work runabout.

The interior of the Centre has been designed so that children can learn about as many aspects of marine studies as possible. In the workshop, first-hand knowledge of fishing equipment including such things as trawl nets, craypots, squid fishing gear can be experienced, and skills such as rope-work learned.

In the laboratory, marine biology is offered to cover such areas as classification and dissection of marine organisms. This room also doubles as the main lecture room in which the dissection tables can be used as chart tables for learning about navigation.

The aquarium room is unique for schools, as it includes a system of aquarium tanks which are continuously fed with sea water. These tanks can be maintained easily, they can be stocked with a wide variety of specimens, and they allow children to view underwater life in a most realistic way.

Emphasis is placed on relating the theory and practice learned inside the Centre to the actual marine environment outside.

Not only does the D'Entrecasteaux Channel have an interesting foreshore and marine ecology, but also a varied, sheltered and safe waterway for children to work in boats. The F.R.V. Penghana is magnificently presented as a proper research vessel. She has instruments such as an echo-sounder, radar, automatic pilot, and sonar for children to study. On deck the hydraulic winch gear and pothauling equipment is efficient and very safe.

This centre is ideal in a number of ways: the re-modelling of the scallop splitting shed was designed to fit the use of the centre and intended programmes — the result is a functional and aesthetically pleasing building; visiting teachers attend a seminar before their visit with the children; the focus of the day's programme is marine biology but the children receive a broad view of man's use of the sea and his responsibility towards it; while the centre provides for day visits only, children from the north can stay in nearby camps at Coningham. Vital to the success of this venture is the initiative, dedication and background of the resident teacher, Allister Martin. With a science degree, Allister worked for two years with Sea Fisheries, part of the Department of Agriculture. This was followed by study for a Diploma of Education and three years teaching at Woodbridge High School. With support from the Regional Office, Allister conceived the idea for a marine centre, developed a submission for the Schools Commission and was funded for 1979-80. It is worthy of note also that the project came to fruition through the interest and help of the local community and the Education Department.

11.2 MOLESWORTH ENVIRONMENT STUDY CENTRE

Molesworth is a staffed, day-visit centre for grades 5-6, within easy travelling distance of Hobart. It is a regional project, initiated in 1975 by the Superintendent of the Southern Region, Mr. Eric Morse, who set aside a room in the one-teacher Molesworth school. The small valley around the school has a rich and varied environment — four trails have been set up through areas of dry forest with sandstone caves, a creek, ponds, and hop farms.

The centre is seen by the resident teacher as playing an important role in teacher inservice — 30 seminars for teachers were held during 1979 — and the room is set up as an "exhibition" room to show teachers what they can do back in their own schools. There is a wealth of ideas and information in the displays and equipment set up in the room - aquaria, terraria, books, table for use of binocular microscopes, tapes of local bird calls, rock display, local plants, bird nests, insects, mammals — and the displays are changed at regular intervals. The room is functional, attractive, and interesting.

The daily programmes are directed at the development of environmental awareness and the integrated approach is clearly directed towards the broad goals of environmental education. Once again, this is a centre whose chief resource is the quality of the teacher in charge.

11.23 WADDAMANA FIELD STUDY CENTRE

In 1975 the Education Department bought the old hydro-electric settlement at Waddamana and in 1976 appointed staff to the only officially designated "field study centre" in Tasmania. This residential centre takes primary and secondary pupils for one week and involves them in an enquiry-based study of the total environment, an integrated approach which attempts to reveal the environment as a dynamic yet fragile thing for which we are all responsible. The history of the area starts with the Permian fossils and goes on to the Tertiary lava flows, the weathering of the valley, and the historic village (1916-1965). The vegetation is sub-alpine, open woodland and closed forest; large and small mammals and a variety of birds are common sights for the children.

A visiting teacher from a school on the north-west coast explained the importance of this visit for his pupils and staff. For the Year 7 children the visit was a first in a variety of experiences in the school's outdoor education programme; the emphasis at Waddamana is on environmental education and social development rather than the adventure type activities of the later years; the almost total wilderness experience is of immense value to urban children; the advantage of resident staff expertise and this influence on the training of visiting staff was heavily stressed.

A small flaw in the operations is due in no small degree to the fact that twice recently all the resource material, including the field laboratory, has been lost due to arson and the centre is only now starting to recover and recoup.

This centre is a valuable asset to the development of environmental education in Tasmania; the quality of the experience is not only due to the richness of the environment, both natural and man-made, but to the interest and broad vision of the resident teacher.

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11.24 MT. CAMERON FIELD STUDY CENTRE

This centre is an example of the several school-based projects which have developed in Tasmania during the last five years. Although called a "field study centre" its emphasis is more on outdoor education, in its broadest sense, than on environmental studies or environmental education.

The Scottsdale High School, 60km north-east of Launceston, built the facilities at Mt. Cameron, in the far north-east of the State, with funds provided by the Schools Commission. However, the whole scheme would not have been possible without the enthusiasm and support of the local community. All service clubs in the district have donated money, materials and manpower to the project. The general management committee, composed of staff members and representatives from each Service Club and Parents and Friends has received help from local building contractors and people in no way connected with the school. The Scottsdale High Student Council donated $1,700 to the project and besides the twelve or so dedicated regulars who have attended 10-12 working bees, about one hundred students have helped in the building phases.

The complex at Mt. Cameron has been planned in conjunction with the Division of Recreation, Lands Department, National Parks and Wildlife Service, local community, and the School. Besides allowing Scottsdale High School to implement its outdoor Programme, the Centre will be available to other schools as well as community groups. Some Service Clubs have already discussed plans to bring underprivileged children to the Centre during holidays. Family groups could also use the Centre. A fitness/initiative/confidence course is being developed in the vicinity of the building. This and the large number of interesting, challenging or relaxing pursuits that will be available at the centre will be of great benefit to parents and children alike.

The Centre was built to allow Scottsdale High to implement its Outdoor Programme, a comprehensive and intensive programme which has evolved over a number of years. At first clubs were formed — mountaineering and bushwalking, kayak, historical and photographic. These were supplemented with various subject-based programmes ranging from conventional geology and biology excursions to Maths surveys, Social Science historical and survival courses to English and Art environment-oriented programmes. Activities days also allow a wide range of outdoor programmes varying from gemstone hunting to skin-diving and skiing.

It is clear that such a programme has immense value, especially in the area of social and personal development, but it would seem that in the area of environmental education the emphasis and input is varied, and, especially in years 9 and 10, comes well behind the adventure experiences.

11.25 PORT SORELL CAMP (Division of Recreation)

It seems relevant within the concept of a State network of field study centres to look at a recreation camp such as Port Sorell and consider its potential as a vehicle for environmental education.

The environment around Port Sorell Camp is ideal for field studies with sufficient diversity to enable programmes with broad objectives to be developed; there is an estuary, creek, dune scrub, woodland, a small settlement, and Asbestos Range National Park close by.

In order to develop Port Sorell as a functional field study centre the following needs should be considered:

1. A plan outlining the purpose of the camp/centre; a policy, a new philosophy.
2. Conversion of the existing camp facilities, a process already in the planning stage —
   - (i) the inclusion in the lower camp of a field study unit, a laboratory-type facility, to upgrade the quality of the field studies
   - (ii) new residential quarters in the upper camp
3. Permanent academic staff; a submission for two academic staff has already been made for appointment in 1981.

TABLE 11.1
For Key see Table - 3.41, 3.42, 3.43

Centre		Authority	Resid. or Day	Staff-ing	Pro-grammes	Ecosystems
(1)	Waddamana	A Div. of Recreation	Resid.	A	2	Central Highlands
(2)	Molesworth	A Regional Centre	Day	A	2	Rural
(3)	Marine Studies (Woodbridge)	A Regional Centre	Day	A	2	Marine
(4)	Hagley	A Resid. Regional Centre	A		4 Social Science	Rural
(5)	Port Sorell	A Div. Div. of Recreation	Resid.	C Manager only	4	Marine
(6)	Conningham	A Div. of Recreation	Resid.	C Manager only	4	Marine
(7)	Rheban Cabin	A Div. of Recreation	Resid.	C Manager only	4	Marine
(8)	Esperance	A Div. of Recreation	Resid.	C Manager only	4	Marine

(9)	Bruny Island	F(a)	Resid.	C	4	Marine
(10)	Dover	F(a) Clarence High School	Resid.	C	4	Marine
(11)	Mt. Cameron	F(a) Scottsdale High	Resid.	C	4	Dry forest
(12)	Storey's Creek	F(a) Riverside High	Resid.	C	4	Sub-alpine
(13)	Guildford	F(a) Burnie High	Resid.	C	4	Rainforest
(14)	Kelso	F(a) St. George's Special School	Resid.	C	4	Rural
(15)	Sprent	A Regional Centre	Resid.	C	4 Rural Studies	Rural
(16)	Mt. Arthur	F(b) Launceston Grammar	Resid.	C	4	Dry forest
(17)	Swansea	F(b) Dominic College	Resid.	C	4	Marine
(18)	Rowallen Hut	F(b) St. Patrick's College	Resid.	C	4	Rainforest, dry forest

CHAPTER 12 — ASSESSMENT OF AWARENESS IN CHILDREN VISITING THE CENTRE:

The central problem in this study of 130 Newcastle (N.S.W.) children may be stated as:

An analysis of the effectiveness of established Field Studies Centres in relating the outcomes of their programmes to primary school pupils' understanding and appreciation of environmental issues of general significance in their community.

The study centres around two questions:

1. What are the field studies centres achieving in terms of their own stated objectives?
2. To what extent is the education system absorbing the new ideas from the field experience and using them to develop an awareness of wider issues?

Keeping in mind the objective of environmental education as outlined by the Belgrade Charter, the criteria of "environmental awareness" for this study were taken to include a knowledge and understanding of ecological concepts, the development of skills in field investigation and problem-solving, and the acquisition of attitudes which will help contribute to a better quality of life. This definition is consistent with the role adopted by the Field Studies Centres in promoting the aims of environmental education.

HYPOTHESES

1. There is a greater degree of development of environmental awareness in children visiting a Field Studies Centre when the visit is for 3-4 days as opposed to 1 day.
2. There is a greater degree of development of environmental awareness in children visiting a Field Studies Centre when that visit is part of a programme drawn up in co-operation with the Field Studies Centre and the school i.e. there is maximum contact with the class teacher.
3. There is a greater degree of development of environmental awareness in children visiting a Field Studies Centre as opposed to those who do not visit a centre.

DESIGN OF THE STUDY

The original experimental model aimed to include studies at Thalgarrah Field Studies Centre (Armidale) and Awabakal Field Studies Centre (Newcastle). The proposed model was as follows:

Thalgarrah (Armidale)
(provides day and overnight visits)

1. 3 days stay, minimum teacher contact
2. 3 days stay, maximum teacher contact
3. 1 day, minimum teacher contact
4. 1 day, maximum teacher contact

Awabakal (Newcastle)
(provides day visits only)

1. 3 separate days (but part of consecutive programme) with maximum teacher contact
2. 1 day, minimum teacher contact
3. 1 day, maximum teacher contact

Also

2 classes who have not visited a Field Studies Centre, but have a well developed environmental programme.

and

2 classes who have not visited a Field Studies Centre, and who do not have a well developed environmental programme.

However, during 1979, the Teacher-in-Charge at Thalgarrah had a number of problems associated with obtaining classes with the right variables, and to date (February, 1980) still has not been able to provide pre and post test results for all the required treatments. In this chapter, therefore, it is possible to make reference only to the results from one centre.

STRUCTURE OF THE QUESTIONNAIRE

A. Based on the stated objectives of the Field Studies Centre, approximately 25 questions in the areas of knowledge (concepts), skills, and attitudes.

B. A test based on wider issues, not necessarily specific to the programmes of the Centre; 6 questions related to an issue shown in a picture, e.g. dumped cars in the bush or on roadsides.

C. Teacher questionnaire for teachers who have visited the Centre.

THE TEST INSTRUMENT

The instrument then developed as follows:

Test 1 — skills of observation	Maximum mark = 40
Test 2 — concepts	Maximum mark = 30
Test 3 — wider issues	Maximum mark = 60
Test 4 — attitudes	Maximum mark = 30

See Appendix D for copies of the four tests.

Test 1

The students were presented with drawings of

(a) five pairs of matched items for which they were asked to find as many differences as possible

(b) five single items about which they were asked to list as many observations as possible

Test 2

Fifteen concepts, chosen from a list supplied by the Field Studies teachers, were tested by multiple choice items.

Test 3

The students were given six illustrated environmental problems and asked to choose alternative solutions with appropriate written rationales which demonstrate a degree of environmental responsibility on a 10 point scale. This test was marked by a panel of seven experts and the marks averaged.

Test 4

Ten items in a simple attitude test previously rated for assesmment by ten judges.

PILOT TEST

All questionnaires were tested in November, 1978, by a total of 60 pupils at two schools in Sydney. Certain changes were made, and a measure of reliability obtained in December with a different class.

Reliability Coefficients for the four tests were as follows:

Test 1	0.82	Test 3	0.77
Test 2	0.73	Test 4	0.86

THE SAMPLE Sixth-grade pupils in the Newcastle area, making a total of 130 children, were selected from the following schools. Care was taken to select ungraded classes in each case, all from a similar socio-economic background.

ANALYSIS OF RESULTS

Questions to ask:

1. Do any schools visiting the centre show a significant increase in any of the areas being tested?
2. Does a school with maximum preparation show a greater increase than a school with no preparation?
3. Does a 3 day visit produce greater changes than a 1 day visit?
4. Are the scores of the control groups consistent with the type of programme operative in their school?

A t test was used to measure the degree of change between pre and post tests.

DISCUSSION:

Newcastle — Awabakal Field Studies Centre

1. Cardiff — 1 day visit, maximum preparation
2. Garden Suburb — 1 day visit, no preparation
3. Dudley — 3 separate days, maximum preparation
4. Warner's Bay — no visit, no school environmental programme
5. Kahibah — no visit, good school environmental programme

RESULTS

	Test 1		Test 2		Test 3		Test 4	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
School								
Cardiff	25.8	28.9	15.9	18.0	40.5	41.0	22.7	26.1
Garden Suburb	18.6	18.3	18.5	19.6	38.7	38.6	22.2	23.4
Dudley	23.8	28.9	17.5	18.0	38.9	40.5	18.8	21.0
Warner's Bay	17.7	—	16.0	—	36.9	—	22.9	—
Kahibah	29.8	—	16.9	—	41.4	—	22.5	—

DISCUSSION:

1. Cardiff showed a significant increase at the 1% level in all but Test 3.
   Garden Suburb did not increase significantly in any area.
   Dudley increased significantly at the 1% level in the skills test, and at the 5% level in the wider issues test, but not at all in the other two areas.
2. Cardiff, a one day visit with maximum preparation, showed significant increases in all areas related to the Field Centre objectives, but Garden Suburb, one day visit with no preparation, did not. The teacher at Garden Suburb is very competent and above average in involvement in the field — it was very difficult for him to adopt the role asked of him and stand aside to allow minimum teacher involvement to operate. Garden Suburb results are therefore significant in that they show little change as opposed to the Cardiff results.
3. It is interesting to note the change in Dudley after three days in the field with respect to the skills of observation. The post-test was actually significantly higher at the .05% level. Consider the wider issues test, wherein one would expect no increase for any school, since such issues are not necessarily specific to the programme of the centre; Dudley was the only centre showing a significant increase, although the post-test score still did not reach the score of Kahibah, the school with a sound environmental programme.

4. A comparison of Warner's Bay with Kahibah and with the visiting schools indicates:
   (i) Warner's Bay is consistently lower than all other schools in all tests but the attitude test.
   (ii) Kahibah is the highest overall scorer in the skills test and the wider issues test, fairly low in the concepts test (a test specific to the centre, however), and average on attitudes.
5. The low scores of Warner's Bay are consistent with its lack of an environmental programme but the score on the attitude test could be due to a number of external influences such as the home and the media. For Test 3, a much more searching test covering both knowledge and attitudes, Warner's Bay scored lower than any other school.

CONCLUSIONS:

1. There is a greater degree of development of environmental awareness in children visiting a Field Studies Centre when that visit is part of a programme drawn up in co-operation with the Centre and the school.
2. Indications are that a school such as Warner's Bay could benefit from a programme developed in co-operation with a field studies centre.
3. The capable classroom teacher who operates a sound environment programme is doing much to develop the right kind of awareness in his/her pupils.
4. Conclusions (2) and (3) support the contention of the Field Studies Centre teachers that their role should include the inservice of teachers to produce individuals capable of mounting their own field and classroom programmes which can have a longer lasting effect.

NEED FOR FURTHER RESEARCH:

An analysis of responses to environmental problems (See Test 3 in Appendix) by the sixth grade children in this study led the author to consider the possibility of drawing up a scale of environmental values, a scale of developing environmental responsibility.

The following scale is suggested by the author as one which could be tested on a sample of children over an age range of 9-12 years. It is based on:

1. cognitive stage theory of Piaget
2. moral development stages of Piaget and Kohlberg
3. responses to Test 3 items by the children in the study
4. the conclusions of a study carried out by Voelker and Horvat (1976).

A theory of the development of an environmental "conscience"

OR

The development of environmental responsibility

Stage 1: Characterised by egocentrism. Other agencies should accept the responsibility. Emphasis on symptoms. Conscious of the existence of rewards and punishments.

Stage 2: Attitude of "save the environment, regardless".
Technology's the key. Decreasing egocentricity, developing sensitivity to others, and reciprocity.

Stage 3: Emphasis on self-responsibility. Shift from egocentrism to compromise. understands limitations of technology. Emphasis on causes.

Examples:

Stage 1: (Question 2) "The car on the left was dumped in the park. I think the Government should get rid of it".

Stage 1: (Question 2) "It may be ugly but you're helping yourself if you take it to a salvage yard because they give you some money for your old car".

Stage 3: (Question 2) "The car left in the bush makes the bush untidy. The cars should go to the wreckers because we can make more things out of the cars".

Stage 2: (Question 6) Reciprocity.
"I think it is sensible because we would not like it if giants came and knocked over our houses to build theirs. And animals don't either.

Stage 2: (Question 4) "I wouldn't drop papers and if somebody else already had I'd probably clear some of it (as much as I could) and then leave the rest to the Council".

QUESTIONS OF VITAL IMPORTANCE:

Reference has already been made to the possible lack of congruence between the demands being made by educators for primary environmental education, and the ability of the child to cope with those demands. Therefore, it seems pertinent, and even imperative, that one should consider a further point of investigation. In Australia, the United Kingdom and the United States, emphasis in field studies centres is on programmes for primary school children. This of course is due to a response which caters for the clients which are able to come to the centres . . . centres in these countries visited by the author in 1978 and 1979 all report the same problem with secondary schools — difficulty in breaking free of the restrictive secondary time-table to enable out-of-school visits to be made.

Therefore, it is important to know what developmental characteristics, as they relate to environmental education, are possessed by the 8-12 year old because if we are expecting too much from these children, as far as the goals of environmental education are concerned, are we not neglecting the stage at which major inputs can be made, the abstract stage in secondary school at which a child is more capable of appreciating problems and able to make decisions based on compromise? In conclusion, the primary child at the level of development of concrete operations needs the actual experience, but how far is he or she capable of undertaking the problem-solving process so that in the primary school we are faithfully fulfilling the aims of environmental education?

The following questions need to be considered:

1. What are the characteristics of development in children aged 8-12 years relevant to environmental education programmes?
2. Is it possible to postulate stages in the development of environmental responsibility just as stages have been postulated in cognitive development and moral development? Is the primary child capable of rational decision-making and the art of compromise in relation to environmental issues?
3. What are values? Is the primary child capable of forming a value system that encourages positive action to improve the environment?
4. Are we concentrating our efforts in schools and field studies centres on the primary child who may not possess the necessary degree of problem-solving skills? Is it presumptious to expect a field studies centre to fulfill the aims of environmental education as expressed in the Belgrade Charter?

CHAPTER 13 — FIELD STUDIES CENTRES AND ENVIRONMENTAL EDUCATION:

It is essential to a study of the relationship between field studies centres and the development of environmental education to restate our working definition of environmental education.

From the Belgrade Charter (1975) the goal of environmental education is:

> "To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones."

The International Union for Conservation of Nature stated at its Conference in Nevada, 1970:

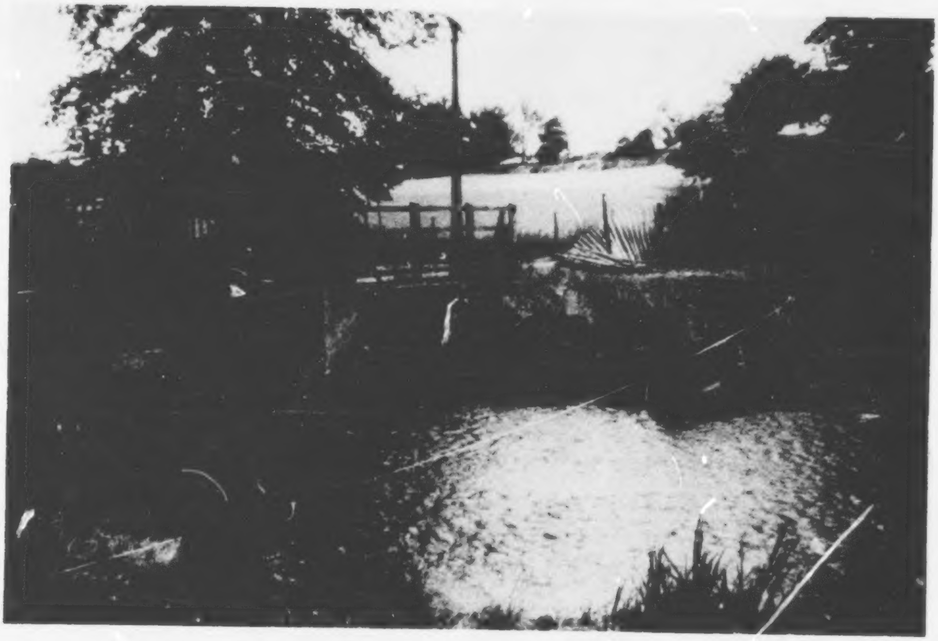
> "Environmental Education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings.
>
> "Environmental education also entails practice in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality".

The broad objectives are —

1. Awareness
2. Knowledge
3. Attitudes
4. Skills in decision-making and problem-solving.

In 1977 at the Gould League National Environmental Education Conference, Lee Williams of Queensland made the following statement in a paper delivered on "Why Field Studies Centres? What Can They Achieve?".

> "Children, and the community in general, are being increasingly involved in debates and decision-making on issues concerning environmental quality. Therefore, it seems important for children and the community to be equipped with the knowledge, skills and attitudes necessary to make these decisions.
>
> "It is my contention that field study centres can make a significant contribution to the production of environmentally literate citizens.
>
> "Field study centres, in this State at least, have already stimulated public interest in environmental education and have awakened teachers to the fact that the Education Department is involved in, and committed to, meaningful environmental education for all citizens. Environmental education can be carried on in many places and it is not my intention to convey the impression that field study centres have a monopoly on environmental education, for the experiences provided at a centre are only one aspect of it".



Measurements at the River Gade, Hertfordshire, England.

The classroom teacher, confident in her ability to take her Grade 1 pupils to a marine rock platform (after inservice at Ku-ring-gai College of Advanced Education, New South Wales).

It is obvious to those who have observed the growth and development of programmes in the field studies centres during the seventies that they have come a long way from the pure ecology-based studies to a wider approach that aims to look at the total environment and man's place in it.

Here are some comments (pers. comm. 1980) from the Director of Arnfield Tower Field Studies Centres just outside Manchester, England.

> "The school should obviously have a programme of environmental education, and the visit to the centre should be part of that programme. The background work and basic skills should be acquired at school before the visit to the centre so that when the children visit the centre they should know how to observe and record, how to read a map and use a compass, etc. so that they can then use these skills at the centre. All too often the centre has to start from scratch, and in a 5 day course obviously has little chance of achieving much.
>
> "My work with inner city children often has very little environmental awareness content. All too often I spend my week dealing with table manners and social graces, and find that the study work comes a second. I'm not saying that this is wrong as I cannot ignore the social training side of the job — perhaps I'm just pointing out that it's a complex issue trying to work out exactly what the centres achieves".

Allen Strom (New South Wales) believes that field studies centres do offer special circumstances for environmental education programmes. He sees the field studies centres as contributing to programmed environmental education in two specific ways:

1. Schools and other educational institutions should programme their own environmental education but they should use the field studies centres as a resource, at one or more points during the programme.
2. The general public could be offered programmes in environmental education using the local environment to better understand resource use and management procedures and problems. Special courses could be offered for teachers and leaders in environmental education programming.

Mr. Strom goes on to say (pers. comm. 1980):

> "Schools and educational institutions have the first responsibility to tailor their teaching to incorporate environmental education or to emphasise resource use planning, particularly in view of the close connection between understanding environmental problems and the home environment of the student. But of course, this leaves a great area of the general public without an opportunity to be involved in environmental education; it also leaves many important resource managers and other authorities connected with the environment (such as local government) without the opportunity to help with environmental education. This position emphasises the need for field studies centres to include amongst their offerings of learning specific programmes in environmental education for the general public (or all who want to come)".

Brian Gilligan, teacher-in-charge at Awabakal Field Studies Centre (Newcastle, New South Wales), defines the role of his centre in promoting environmental education (pers. comm. 1980):

> "One of the primary concerns of Environmental Education is to bring people to an awareness of their surroundings."
>
> "Such awareness is prerequisite to the understandings and value judgment development inherent in the long term perspective of Environmental Education.
>
> "I see the Awabakal Field Studies Centre as making a significant contribution to the development of skills and awareness in students in the early stages of the Environmental Education process. The Field Studies Centre also assists these processes and other longer term goals by having an influence on the class teacher through:
>
> (a) "demonstration" lessons with classes in the field.
> (b) inservice courses and advisory visits to schools.
> (c) resource materials prepared by centre.
> (d) providing co-ordination and a communication channel between teachers and resource people and institutions (e.g. National Parks and Wildlife Service, Forestry, Historical Society and other personnel as well as valuable individuals and places in the community).
>
> "By taking advantage of a multitude of direct and indirect opportunities to make a contribution at the community level, the Field Studies Centre can also achieve some environmental education goals in the community at large.
>
> "Overall, the Field Studies Centre should function as a regional resource centre and advisory centre for environmental education (as defined by the Belgrade Charter).

Mr. Gilligan states above that the field studies centre makes a significant contribution to the development of skills and awareness in students **in the early stages** of the environmental education process. This would seem to be the contribution of all field studies centres observed in Australia and overseas. Therefore it would seem that the field studies centre programmes fall short of the working definitions, where value judgments and skills in decision-making are the main goals. This does not mean that field studies centre programmes as they stand are not vital to the **total** process, but the later stages of that process may only be possible if field studies centres with the broad vision can produce programmes for adults capable of more formal thought processes.

It should be pointed out that some environmental educators hold that the main objective of any environmental programme is attitudinal change. It follows then that no real evaluation can be made until some distance into the future when new real problems face the community and the reactions of the students of earlier days can be measured. It follows also that emphasis by the centre on attitudinal change in the class teacher is a more effective long-term goal than trying to produce change in children by a one-day visit or even a five-day visit.

In the States like South Australia and Tasmania where the Education Department promotes a programme of Outdoor Education, it is often difficult to estimate how much of the outdoor programme comes under the heading of "environmental education".

Tony McKenny, Tasmania, Consultant in the Division of Recreation, gives the following point of view:

> "Field studies as referred by COOEE are seen as multidisciplinary studies of the environment which complement and supplement the classroom experience. Clearly there is considerable affinity and overlap with Environmental Education, and there is some debate as to whether they are the same or separate entities. If, like me, you accept that outdoor education is not a subject but more of an approach or a setting for education, then any part of the subject called Environmental Education that is taught outside the classroom is, ipso facto, Outdoor Education".

Charles Sinker, Director of the Field Studies Council of Great Britain said during interview in 1978 that the Council Centres in England and Wales were concentrating more on basic ecology than on environmental education. This was because the schools, 60-70% of the custom, were restrained by examination requirements, and the customers must be satisfied, i.e. the schools are the tail that is wagging the dog. This broader environmental education is really outside their charter, Sinker said, not outside it but making only a small contribution. It must be left to the schools to see that it is a continuing process.

Ann Trotman, director of a field studies centre in Hertfordshire, England, writes of the difficulties imposed by the authorities (per. comm. 1980). All the field studies centres, in that county at least, have to justify themselves in educational terms in order to remain in existence, in the present economic climate, and in effect this means supplying the necessary background for C.S.E. 'O' and 'A' level examinations as far as the secondary level is concerned.

In primary range, the courses must introduce a substantial core of what is considered 'basic' education at the moment, i.e. language development and mathematical skills, and scientific method.

A recently published H.M.I report "A View of the Curriculum" comments that "Fieldwork could be a week sometime in the school year **if there is time**". Since this is the official attitude teachers have to combat, the only way for centres to be seen to be considered essential is to supply coverage of what is at the moment considered essential to syllabus content and the three R's. Add to this, she continues, the haphazard and piecemeal way in which most of the L.E.A. centres in the U.K. have come into being and the picture presented is not one which would suggest adherence to the I.U.C.N. definition of environmental education.

However, this same director sees that it is still possible to keep the I.U.C.N. definition in mind while planning courses. She believes there are two ways of doing this:

1. In the structured course where relationships of man/environment, evaluation of environment, etc. appear on the programme
2. By indirect means. Attitudes are the result of a variety of experiences, and it is the **way** children are introduced to studying the environment, at whatever level or subject approach, which guides them toward attitudes of appreciation, then to evaluation, then to responsibility, regardless of the section of the syllabus which may be on the programme.

> "I am a very firm believer in this indirect approach, as a child may 'internalise' experience better this way, when he is not under pressure to do so, and no amount of purpose-built accommodation, liaison with the local administration, careful planning, etc. will achieve the desired result if the child gets the feeling that this is all being imposed upon him, and starts to build up resistance as a result".
>
> (Ann Trotman, Chorleywood Field Studies Centre, Hertfordshire).

There seems to be a greater concern for environmental problems in the United States, and in the past decade numerous interpretative centers have mushroomed throughout the whole country. The community nature centres which cater for school groups and the general public seven days a week appeared to have their programmes more firmly grounded in environmental education than their counterparts in Great Britain. Duane Toomsen, Consultant in Environmental Education for the State of Iowa, made this comment (pers. comm. 1980):

> "In summary, the nature centers do have some weaknesses. These are basically insufficient funds; inadequate attention to philosophy, goals and objectives; and immaturity of the naturalist. There are also some positive strengths which include highly motivated and well trained interpreters; a strong inclination to build greater environmental awareness; and diversity of program and center design. At this stage of early growth it is rewarding to see a variety of models that will ultimately complement each other as they grow and develop. It is also evident that they do provide a major role in heightening the understanding for the environment by the public".

The table on the next page is an attempt to correlate the growth of the field centre network in New South Wales with the development of the concept of environmental education. As the concept of environmental education has become established both overseas and in Australia the role of the field studies centre has changed from acting as a guide to children on nature walks to promoting the long-term goals of environmental education. This is done by the influence of the centre, its staff and its environment, on the classroom teacher.

"Field Studies Centres"

1. Agricultural Camps — pre World War 1
2. 1940 — Broken Bay National Fitness Camp
3. 1942 — Point Wolstoncroft National Fitness Camp
4. 1946 — Crommelin Biological Research Station (Sydney University)
5. 1950 — Narrabeen Lakes National Fitness Camp
6. 1954 — Myuna Bay National Fitness Camp
7. 1958 — Arrawarra (Coff's Harbour) for University of New England
8. 1964 — Barren Grounds Nature Reserve Field Studies Programmes
9. 1965 — Chakola — private

   N.B. 3 others were established in the sixties

10. 1973 — Muogamarra
11. 1974 — Camp Knox
12. 1974 — Bumberry

   N.B. 20 other centres were established in the seventies

1. 1970 — Australian Academy of Science Conference
2. 1974 — Report of the Committee of Enquiry into the National Estate — included recommendations on field studies centres
3. 1974 — C.D.C. Survey of Needs for Environmental Education in Australia.
4. 1975 — C.D.C. Proposal for the Support of Environmental Education in Australia — includes recommendations concerning field studies centres
5. 1977 — Lorne Conference
6. 1977 — 1979 C.D.C. National Environmental Education Project
7. 1980 — proposal to establish an Australian Association for Environmental Education.

SUMMARY

1. Field studies centres in Australia and overseas vary considerably in the particular emphasis of their programmes. The degree of commitment to the broad goals of environmental education is very much a function of the particular individual in charge of the centre.

2. Centres in the United States apply their programmes more to a general awareness of the environment then the centres in Great Britain, particularly those ones catering for secondary school pupils.

3. Over the past decade centres in Australia have moved from an emphasis on ecology-based studies to a broad study of the total environment.

CHAPTER 14 — THE ROLE OF NATIONAL PARKS:

This chapter will examine the role of the National Parks system in Australia and overseas, as perceived by Parks personnel, as it related to the development of field studies centres and environmental education.,

14.1 NATIONAL PARKS IN U.S.A. and U.K.:

14.11 EFFIGY MOUNDS NATIONAL MONUMENT (IOWA)

150-200 students per day visit this park in Fall and Spring. They see a slide programme, visit the museum, and take a guided walk on the trail. School visits are conducted by rangers who have a strong naturalist training.

The National Park hierarchy's philosophy is to increase emphasis on environmental education — they believe study areas should come from outside.

The Senior Ranger at Effigy Mounds believes it would not be suitable for the management of this park to have a residential environmental education center (because of the preservation priority of the mounds), but it would certainly be appropriate in some other parks. Some national parks, he added, already have 3-4 environmental education centers. In essence, the decision as to whether a park should support a center depends on the designation of the park, the main objective of the park and the kind of management plan it has.

14.12 POINT REYES ENVIRONMENTAL EDUCATION CENTER (CALIFORNIA):

Refer also to Chapter 2.

This center is a co-operative effort between local schools and the Point Reyes Park Service. The manager is a Park Service employee, salary paid ;by the Service, this being the only Service commitment to the center, apart from the land itself i.e. the Point Reyes Park Service controls the management of the land and buildings.

14.13 HAPPY ISLES NATURE CENTER (YOSEMITE NATIONAL PARK, CALIFORNIA):

This center is open 7 days a week from late June to early September, operated by ranger naturalists. From May to June, and from September to October, it is open week-ends only. At present its programmes are in a transition stage as plans are being made to move towards more family oriented activities. The programmes will not be academic or structured, but semi-structured and low key.

The supervisor, Jerry Woodcox, believes their emphasis is as much on environmental education as on just nature concepts alone.

14.14 HARTMAN NATURE CENTER, HARTMAN RESERVE, (CEDAR FALLS, IOWA):

This center is under the management of the County Conservation Board which appointed a Community Advisory Council (9 members) who live in Cedar Falls and meet once a month.

A trained naturalist works in the center 5 days a week, and trained volunteers help out on Friday, Saturday, and Sunday. Special programmes are organised for the general public on Sunday afternoons.

14.15 THE TILDEN CENTER — EAST BAY REGIONAL PARK DISTRICT (CALIFORNIA):

Refer also to Chapter 2.

This Environmental Education Center opened in October 1974 in Tilden Regional Park, Berkeley.

The staff includes 5 naturalists, all with an educational role, paid by the Regional Parks District.

The objectives of the center are:

1. To cater for the whole community, from wilderness hikes to supermarket walks,
2. To develop awareness and appreciation rather than knowledge and understanding (this being so because of the length of the contact time which is approx. 2 hours).

14.16 ITASCA STATE PARK (MINNESOTA):

This park has no field studies centres for schools or community, but one residential centre, the Itasca Biological Station, established in 1909, and controlled by the University of Minnesota. The field station leases 40 acres (in a park of 50 square miles) and the University is responsible for management and maintenance. The superintendent of the University Station feels this is a very good example of a co-operative venture — the Station has a secure site, and the Park gains from the Station because of its research and ability to act as consultant in all aspects of natural history concerning the Park. However, a Park naturalist admitted that the Park feels threatened by the information from the University Station — they don't want to use their expertise, he claims. The same naturalist believes that field studies centres as we have them in Australia would not be acceptable in Parks because —

1. Staffing should be on a permanent basis (rather than on short-term secondment) to allow time to develop greater expertise in programming,
2. Rangers would feel threatened because education officers may try to change park operations i.e. interfere with management.

14.17 PEAK NATIONAL PARK (ENGLAND):

Peak National Park, Derbyshire, England, is just one National Park in Great Britain being faced with a task which appears to have no easy solution.

Peak National Park, 542 square miles and declared in 1951, had 16 million visitors in 1978; it is an oasis in the centre of a massive industrial area — approximately 2,000 schools exist within half an hour's drive of the Park. Mr. Ian Langden, Youth and Schools Liaison Officer for the Park, said, "We are fortunate, we only have thirty field centres. Snowdonia has about one hundred". These figures of course include all types of centres — day, residential, Y.H.A. sponsored, outdoor pursuits, religious bodies, etc. Losehill Hall in Peak National Park is the first residential centre to be opened by a National Park Authority. Its purpose is to aid those who wish to know more about the Peak National Park or to study its environment. This centre provides accommodation for 60 people in single or double bedrooms. Facilities for teaching comprise a purpose-built, versatile teaching area which can be quickly and easily divided into smaller units. The Centre has a comprehensive range of audio-visual aids and teaching equipment. The centre, more properly designated the Peak National Park Residential Study Centre, Losehill Hall, has a residential principal, Mr. Peter Townsend.

However, Mr. Langden claims that the field studies centres present no management problems for the Park — most of them have responsible resident wardens; yet it is interesting that there are no rules laid down by the National Park governing the activities of the Centres. The problems are caused, Mr. Langden claims, by school day visits which are poorly supervised by teachers untrained for work in the outdoors. On the day of the interview with Mr. Langden, he reported that just that morning 300 children had arrived by train from Luton, were met by coaches and distributed over the Park. One other school a month before had brought 600 children and left them all at the limestone caves at Castleton, a honey-pot which he claims is already a write-off.

Problems of Day Visits

1. Trespass (almost 100% of the Park is privately owned).
2. Sample collecting.
3. Questioning of locals.
4. Litter.
5. Erosion of footpaths.

Main Concerns for the Liaison Officer

1. Lack of publicity and communication — most teachers do not know that a park liaison officer exists.
2. Inservice training is an overwhelming prospect; it is difficult to have teachers in school time unless it is a sponsored course.

Problems Unique to Peak National Park

1. 40 thousand people live in the Park.
2. I.C.I. has just been granted permission to dig for limestone in the Park.
3. There is a demand for water for surrounding industrial areas — valleys could be flooded by the building of dams.
4. Pressures exist for mineral development.

Efforts to Overcome Problems

1. Mr. Langden is planning day visits to Teacher's Centres to explain about the use of the Park and visitor responsibility.
2. Some literature has been produced.
3. Losehill Hall has run some courses for teachers, but, Mr. Langden asks, is it the responsibility of National Parks to inservice teachers?

14.2 NATIONAL PARKS POLICY IN AUSTRALIA:

14.21 QUEENSLAND

The National Parks and Wildlife Service in Queensland has a section known as Technical Services, and this contains an Interpretive Section which includes all aspects of extension, including environmental education. The policy of the Service does cover all aspects of interpretation and environmental education for schools, staff, and general public, although there is no Service policy on field studies centres.

Rangers take school groups around the Parks, but would prefer to spend their time training teachers — they have run a few training programmes for teachers — but there is not enough Service staff to do this on an adequate scale.

Spokesman for the National Parks and Wildlife Service, Peter Ogilvie, believes that field studies centres could be placed in National Parks if activities were limited (e.g. no collection of samples), so ideally he sees the development of a system of reserves, under the control of the N.P.W.S., whose chief objective would be to promote the aims of environmental education. These reserves could supply the sites for field studies centres; at present no such "reserve" category exists in Queensland.

Binna Burra Environmental Studies Centre, established by Binna Burra Lodge on private land, uses Lamington National Park, but with activities restricted.

An Education Department representative (pers. comm. 1979) expressed concern that the educational activities of the N.P.W.S. may be duplicating the efforts of the Field Centre network. He quoted the case of Koorboora, a Departmental Field Study Centre near Girraween National Park where the N.P.W.S. has built an interpretive centre with high grade camping facilities. The Park centre has a full-time interpretation officer who conducts guided walks, supervises slide shows, and interprets the displays. The criticism was that the N.P.W.S. is only putting across the National Park ethic (worthwhile, of course) and not the total view embodied in the objectives of environmental education, which the Departmental centres aim to do. Will teachers, confronted with a choice of excursions, know the difference?

14.22 SOUTH AUSTRALIA

The National Parks and Wildlife Service in South Australia does not have a policy concerning environmental education or field studies centres. The spokesman for the Service agreed that the Service does have a responsibility for education; he quoted the new appointment (early 1979) of a ranger to Cleland Conservation Park to supervise interpretation and educational activities. Should field studies centres be established in parks? The answer was, Yes, in Recreation Parks; Yes, in some National Parks (e.g. Flinders Ranges), but not in Conservation Parks where the aim is preservation. It would be acceptable to place a centre on a site outside a Conservation Park if certain restrictions were placed on the use of the Park, especially if it had fragile areas. The Service spokesman expressed the opinion that the Service would prefer to put up a building in a Recreation Park and control its use and management. In 1972 the Director of National Parks (then an autonomous body) gave permission for four Adelaide High Schools to lease a site for a field studies centre in Para Wirra Recreational Park. But senior ecologists who were not consulted were not in agreement with the decision. To-day the N.P.W.S. (established late in 1972) regret the Para Wirra lease — its preference is for total control of the property with perhaps a seconded teacher as staff. Another objection is its restricted use to four schools — a park centre should be available seven days a week.

The Ranger at Cleland Conservation Park expressed the opinion that Parks people should undertake responsibility for the education of the total ccommunity; a field studies centre, day or residential, could be appropriate in some parks, he added — a decision about centres in parks could not be a generalized policy because some parks could cope with the impact of a centre and some could not.

Both the Service and the Education Department separately expressed the opinion that the ideal set-up for South Australia would be a network of centres, established and managed by the Service, and staffed with help from the Education Department. National Parks in South Australia (not recreation or Conservation Parks) show a sufficient variation in animal populations, topography, vegetation and soils for a system of field studies centres to be developed which could adequately sample the different environments in the State and so display diversity in their programmes.

It is clear that if someone were to take the initiative in this matter, a joint policy between N.P.W.S. and the Education Department would lead to benefits for the people of South Australia in the area of environmental education.

14.23 VICTORIA

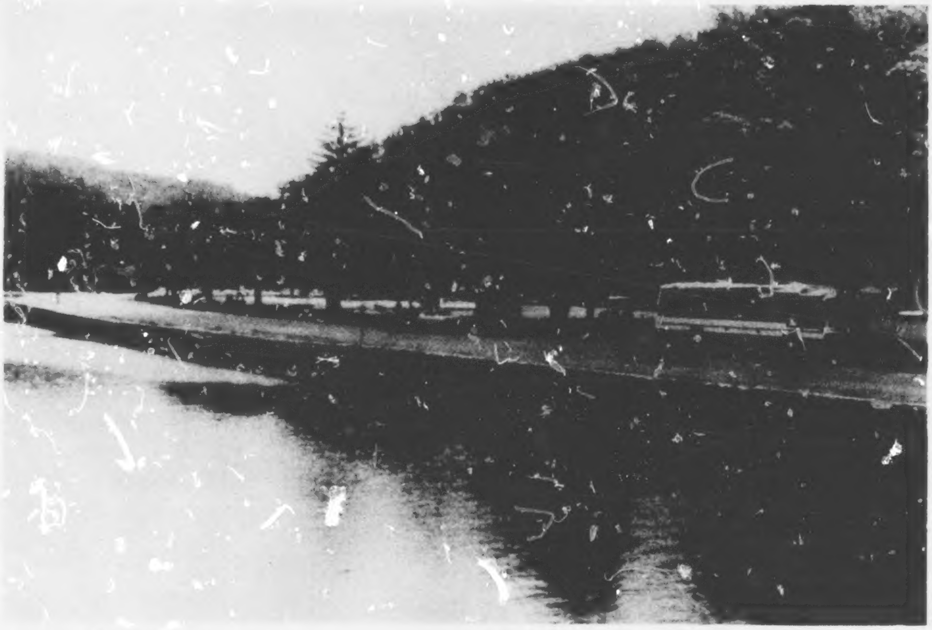
The National Parks Service of Victoria has an Interpretation Branch with an Education Officer, a section which holds the responsibility for the education of park visitors - actually only an information service to date, not even much interpretation. Schools are visiting parks, and rangers are helping out on a small scale, but the Victorian policy is not to become too involved in education - management and recreation are the main priorities of the Service, with claims that education should be the responsibility of the Education Department. However, several separate attempts to acquire teachers for Wilson's Promontory, Organ Pipes National Park, and Haining Farm have been unsuccessful, so at present a stalemate exists.

In Victoria, the Land Conservation Council has set aside 39 Education Areas, two of which have been recommended for development. Many of these are adjacent to National Parks and the L.C.C. has recommended that the N.P.S. should manage and service these areas. However, there has been a singular lack of co-ordination and planning for this network by the L.C.C. and other presumably interested bodies. Virtually no development has been accomplished either conceptually or on the ground, and the N.P.S. personnel express the opinion that the concept of Education Areas appears to have developed into just a holding scheme with development planned for some indeterminate time in the future.

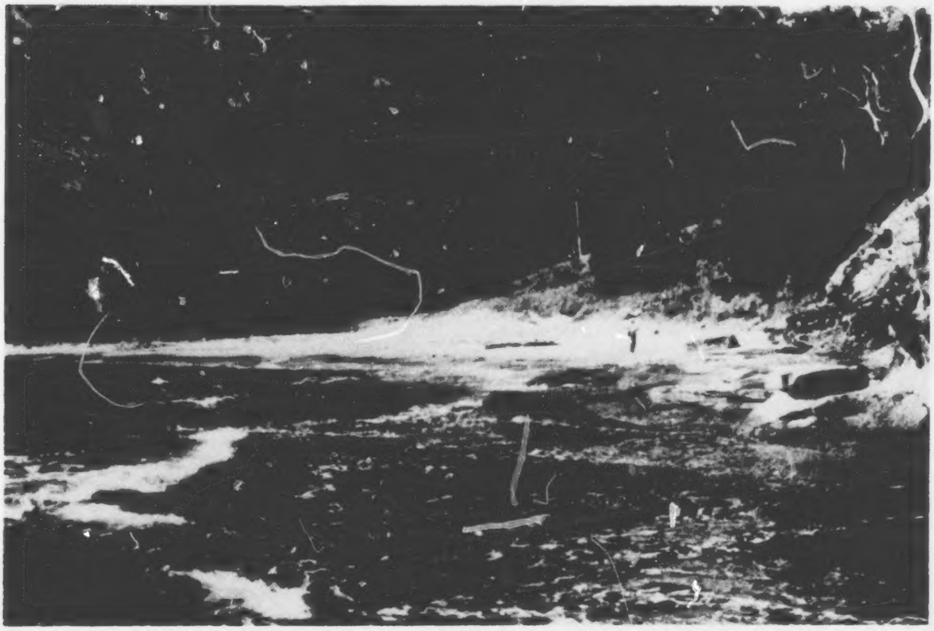
The National Parks Service in Victoria is not against the placement of field studies centres in parks, especially if there is an education area nearby, and if the Education Department supplies some staff. But restrictions would apply in parks even though none would apply in the Education Areas. The Service has plans to build a centre in the Organ Pipes National Park, which has 3-4 thousand student visitors a year, but the plans include the use of a seconded teacher and, as mentioned before, requests have already been refused.

Field studies centres in parks for the general public? The Senior Interpretation Officer in Melbourne believes there is not enough public interest at the moment to warrant their establishment, and the staffing shortage in the N.P.S. would not allow for such developments either. Highfield (near Cape Schanck) is a farm property in Nepean State Park acquired four years by the N.P.S. who see it as an environmental education centre, but development so far has been restricted by lack of staff.

The Senior Ranger of Nepean State Park agreed with the South Australian opinion that field centres would be appropriate for some parks, but not for others. In general, he added, placing centres in National Parks is a sound idea because adults and children need to be educated about the National Park ethic, as well as other environmental concepts.



Should there be centres in National Parks? Bobbin Head, Ku-ring-gai Chase National Park.



Unspoilt beauty of the National Parks - West Head, Sydney.

14.24 WESTERN AUSTRALIA:

In general, the National Parks Service of Western Australia is delighted to know that its parks are being used as an educational asset, for it believes that this is one of the best ways of getting across the conservation message. However, in its Management Policies there is no specific mention of field studies centres, although Sections 5.8 and 6 have some relevance to the concept:

> **Section 5.8.3.** "Where the use of a park justifies it, a visitor centre may be set up to provide information on park activities, interpretation, and for certain administrative functions. Such a facility must be constructed only when it has been determined that indoor media are the most effective means of telling visitors about park resources".

But the Authority has discussed the matter of field centres, and in 1977 adopted as general guidelines:

> "Many parks are suitable for field studies in conjunction with all levels of education. Field Study Centres should be built adjacent to a park, so that they may use its natural environment to the fullest advantage."

The National Parks Service does not wish to be involved in the construction or management of such centres. It has neither the money nor the staff. However, N.P.S. staff would certainly co-operate with the organisation responsible for the centre, by providing suitable interpretive material and selecting and maintaining study sites.

The Service spokesman commented that whether a centre should be within a national park or alongside it would depend very much on the size of the park and the location of other facilities. In a small park the centre should be outside, while there may be a case in a large park to create a field study centre within its boundaries. In this case, the N.P.S. may be prepared to consider the provision of an appropriate piece of land.

14.25 AUSTRALIAN CAPITAL TERRITORY:

In the A.C.T., the Department of Capital Territory is responsible for Parks and Reserves, specifically the A.C.T. Conservation Service which is part of the Conservation and Agricultural Section. The Director, Dr. Brian Pratt, stated that there is no written policy by this department on environmental education or field studies centres, but he did make the following relevant points:

1. The Conservation Service does welcome the use of the A.C.T. Parks as sites for study, but there are no field studies centres as such (he disagreed with Mr. Coreau's claim that Birrigai Recreation Camp should be classified as a field studies centre — see Chapter 8).
2. Since the A.C.T. is small in area, there is really no need for a system of field studies centres (even one or two) because of easy access to reserves and the availability of advisory personnel: a teacher can arrange for a representative of the A.C.T. Nature Conservation Service, a technical or professional officer, to accompany the group.
3. A field studies centre is not necessarily the best answer for community education; a visitor's centre is probably adequate. Dr. Pratt claims there is a limited demand from the public for facilities such as field studies centres.

14.26 NORTHERN TERRITORY:
When an interview took place with the Assistant Director of Territory Parks and Wildlife Commission, Mr. Murray Elliot, self government for the Territory was only four months old and any proposals supported by the Commission had not yet been taken to Cabinet.

No policy exists on education or the development of field studies centres, although Mr. Elliot said that plans for centres have been considered for a number of years but restrictions on staff and finance have prevented any development.

In the near future, emphasis will probably be on the establishment of simpler Interpretation Centres before considering field studies centres, day or residential. He sees the Alligator River Centre in Kakadu as probably the first centre in the Territory.

Mr. Elliot is of the opinion that a park or reserve is an acceptable place in the Territory for a field studies centre because they have better resources and the Commission could undertake responsibility for management. He believes a co-operative venture with the Education Department is a possibility — co-operative at all levels, both planning and implementation, although he agrees that facilities should be made available to the general community.

Mr. Greg Miles, Ranger in the Northern Territory, believes that field studies centres are a definite need in the Territory — with expanding urbanisation, too many people being alienated by technology, and man's impact on the environment increasing every year, education has to be the answer. He sees a field studies centre in a Park as a separate entity from the interpretation centre; the field centre could be supplementary to the National Park efforts, and cater for students and tourists. The public, he claims, has a right to know how National Parks and Reserves function, the reason behind protection laws, how ecosystems operate, the basis of land management policies, and the wealth of natural history to be learned in areas yet relatively untouched.

Mr. Miles, when asked about the siting of field studies centres in Parks, answered that these would be better placed away from the main part of the Park in a zone leased for educational purposes. If it is to be a multipurpose field studies centre, management could be in the hands of a National Parks authority or a Statutory Board or Commission set up for that purpose. Kakadu as a site appears to be in a unique position with no management or administration problems, as compared with the various Australian States which have financial and staffing problems.

A number of Rangers with the Territory Parks and Wildlife Commission expressed the opinion that, from their experience, some sort of education centre is needed in the Parks — visitors are continually approaching the Rangers with queries on the area — the geology, the flora, and the fauna.

14.27 NEW SOUTH WALES:
The National Parks and Wildlife Service of New South Wales is the only National Parks Service in Australia with a written policy on environmental education and a commitment to develop field studies centres on its land. Also a New South Wales park, Royal National Park, already does support a field studies centre with facilities provided by the Service and staff supplied by the New South Wales Education Department. The teacher-in-charge, Mr. Gary Schoer, feels that this joint venture is a successful one; although at the moment facilities are restricted, he feels that the field studies centre should not be a separate entity, but part of the Service complex to allow for free communication between Rangers and the field centre personnel. Mr. Schoer has not found Service Management policy restrictive, and he himself continually promotes National Park policy with all visiting school groups. Unfortunately, as is the case with all centres staffed by the Department of Education, use is restricted to four days a week during school terms, no week-end or holiday use, and schools are restricted to Government schools. The new Service policy recognises that any centres set up by the Service will be available to the community at large, and hopefully, if staff is available, will be open seven days a week. For Australia, this is a major breakthrough.

In the absence of a policy from any other State in Australia, it seems appropriate to include the contents of the New South Wales policy in this section, noting specially the reference to field studies centres. Note the agreement between the criteria for a centre adopted by this study and the criteria in the policy statement.

POLICY ON ENVIRONMENTAL EDUCATION (1979):
The National Parks and Wildlife Service has a statutory responsibility for education with respect of lands under its control, wildlife and Aboriginal relics. furthermore, it is obvious that the Service can only achieve its other objectives for the conservation of the State's natural, historic and prehistoric heritage if it has the support of an environmentally aware public. The Service must therefore actively seek to foster environmental awareness within the community at large.

The Service accepts the definition of Environmental Education given by the International Union for the Conservation of Nature and Natural Resources (IUCN), which is:

> "Environmental education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings. Environmental education also entails practice in decision-making and self-formulating of a code of behaviour about issues concerning environmental quality."

The Service also accepts a series of goals, objectives and guiding principles for environmental education which were adopted at the Intergovernmental Conference on Environmental Education held in the U.S.S.R. in 1977 and attended by delegates from 66 nations.

These goals were:

1. To foster clear awareness of and the concern about economic, social, political and ecological interdependence in urban and rural areas.
2. To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment.
3. To create new patterns of behaviour of individuals, groups, and society as a whole towards the environment.

The Service charter to protect wildlife throughout the State requires it to take advantage of its opportunity to be involved in environmental education. All land use affects wildlife, and the community's understanding of the effects of land use on wildlife and the factors which motivate land use are essential to the conservation of nature and the maintenance of environmental quality.

POLICY

It is the policy of the National Parks and Wildlife Service to develop programmes of environmental education which will complement similar programmes undertaken by other government departments, education institutions and community organisations.

In order to fulfil this policy, the Service —

1. recognises and confirms to the goals, objectives and guiding principles for environmental education as defined by I.U.C.N.
2. will co-operate with and, where necessary, convene meetings with other authorities having responsibility for and conducting programmes of environmental education
3. will produce resource material, for environmental education including publications, charts, posters, slide sets, films and video programmes.
5. will continue to assist with the in-service training of teachers by organising teacher training schools/ seminars in Service areas and will provide educational programmes for

- youth
- the rural community
- honorary rangers
- members of community associations involved in the conservation of natural/human history
- other interested groups

5. will establish Field Studies Centres on land managed by the Service. Recognising that such centres should be available to the community at large, the capital and running costs for the centres will be borne by the Service.

DEFINITIONS

For the purpose of this Statement Field Studies Centres should:

1. include a suitable building and complex of buildings furnished and equipped to meet the needs of users and the needs of the particular centre's environmental education programmes
2. be located in close proximity to an area of accessible land providing a contrast of landscapes and land uses and offering a diversity of natural, semi-natural and human made sites for the purpose of environmental studies
3. have a clearly defined conservation and educational policy or plan
4. be supervised by qualified and competent personnel with the responsibility for initiating, developing and conducting educational and related programmes in a creative and flexible way.

14.28 TASMANIA

The National Parks and Wildlife Service in Tasmania considers environmental education to be important, but it is of low priority in economic terms.

The Service has no policy statements on education or field study centres, and among Service personnel opinions differ as to the wisdom of placing centres in National Parks.

Maria Island is one example of a park used by schools — visits average two a week — but there are no printed programmes or teacher's guides prepared by the Service. A commendable joint project was well under way in 1979 with members of the Education Department and N.P.W.S. to establish a field study centre on Maria Island National Park, but plans were suddenly dropped, ostensibly because of finance, but perhaps because of change of personnel and lack of a positive policy.

Education for the tourists who visit Lord Howe Island?

CHAPTER 15 — CRITICAL EVALUATION OF THE VARIOUS SYSTEMS:

This chapter will attempt to critically evaluate the various systems operating in each State in relation to field studies centres. The evaluation, by virtue of the methods employed and the time factor involved, cannot be an objective measurement, and this state of affairs could merit a certain degree of criticism. However, from observations made overseas and in Australia, and from interviews with personnel involved in each system, certain features about Australia in general, and each State in particular, stand out clearly against the background of overseas activity.

15.1 THE AUSTRALIAN SCENE:

The major feature of the field studies centre network in Australia is its monopoly by government organisations (mainly the Education Department), and the relatively minor involvement by the general community. It is true that community organisations worked to convince the authorities that centres such as Awabakal, Wambangalang and Bournda should be established in New South Wales, that Tomato Lake should be established in Western Australia, and Binna Burra Lodge in Queensland. Private individuals, numbered on the fingers of two hands, have set up a variety of facilities, and the tertiary institutions support their field stations. But the intensity, the commitment, the involvement of the community as it is seen in the United States far surpass the scattered and unco-ordinated efforts of the Australian public. Let it be said that lack of awareness, which stems from lack of education, is creating a vicious cycle, and where commitment does exist, often this is stifled by a lack of funds to support even a secretariat to help mount courses in environmental education for the general public. It means that a lack of concern **by** the general public causes a lack of facilities, such as field studies centres, **for** the general public.

In the United States, the Service organisations (e.g. Rotary), the conservation groups (e.g. Audubon), the Fish and Wildlife Service, the Park systems, a city, a county — all will provide finance to establish and support a centre. But, furthermore, volunteers, in great numbers, are trained in evening courses to be able to act as leaders and teachers in week-end shifts, or as extras for school groups during the week.

Queensland is the only State with a sound systematic plan for the development of centres, that is, centres for school children. The plan aims to bring environmental education programmes within reach of all children in the State, even those in the outback. New South Wales has 48 centres involved to some degree in field studies and/or environmental education, but the network in no way provides adequately for the population of the whole State. A breakdown of types of centres shows the emphasis on provision of facilities for schoolchildren.

Department of Education Centres (State schools only)	10
Closed schools	13
Private management	6
Sport and Recreation Centres	10
Tertiary institutions	7
Private school	1
Individual State school	1

Only the six private centres accept members of the general public, but the bulk of their clientele is still school groups.

Figures for 1978 have been obtained for the Education Department centres in both Queensland and New South Wales, and these are of particular interest.

	Queensland	**New South Wales**
Total number of Government pupils	345,970	812,156
Total number of pupils (Government and non-government schools)	439,964	1,032,919
% of Government pupils visiting centres	7.8%	2.8%
% of total school population who visited centres	6.1%	2.2%
Total number of centres in 1978	11	9

It would appear that Queensland's field studies centre network is catering more efficiently for the school population than the New South Wales one. Per head of school population, Queensland has more centres, and plans involve provision for more areas not yet centres. The New South Wales network is quite inadequate for its population and plans for expansion are not being considered at present.

However, both states are reaching only a fraction of the school population and these figures show how much further the expansion of the network needs to go if environmental education, through field experience and expert guidance, is to be a reality for the majority of school children.

The Northern Territory, by virtue of its isolation, is probably 8-10 years behind the other states. Western Australia, one of the few states with a policy statement on environmental education, is suffering from a lack of qualified staff for its centres, and of course finance allocated to this area. The network is most inadequate, even for the populated areas, and classroom teachers lack expertise and direction to implement the policy. In Victoria, there is a limited demand for field centres by teachers because of the extensive camping programme, but this programme does not work adequately towards the objectives of environmental education. The South Australian teachers do not see field studies centres as an answer to their needs — they want a netowrk of education areas and a team of advisors.

It should be pointed out at this stage that throughout the whole of Australia, staff in centres are coping extremely well with the cognitive and skills components of environmental education, but the area of values, issues and personal relevance needs more attention. In other words, there is still too much emphasis on the field studies component and not enough on the broad objectives of environmental education. It may be argued that this is not the role of the field studies centre — that in the time covered by a visit, it is enough to develop a new awareness, to lay a foundation on which the classroom teacher should develop these broader areas. Yet a school-based programme, operated at its own centre and by its own staff, also neglects the development of concern and the development of skills in problem-solving and decision-making. This reference is to the aims of the camp programme for Marion High School in South Australia (see page 71 in Chapter 5).

15.2 THE STATE SYSTEMS

15.21 Queensland

The Department network in Queensland (Department of Education) is a commendable effort to bring environmental education within the range of almost all children in the State. Factors which recommend the network include:

1. The centres are open to all types of schools, government and independent;
2. The plan looks systematically at all areas in the State to be serviced;
3. Management techniques are applied at the centres where certain areas can be "rested" for 12-18 months;
4. Staff for centres undergo a training programme;
5. The concept of a mobile centre to service the schools of more remote areas.

The programmes in the Queensland centres move close to the ideal, i.e. promoting the objectives of the Belgrade Charter, but, as in other States, there is still too much emphasis on the field studies component. However, at Jacob's Well, the staff have developed a mangrove study with the aim of studying not only diversity and adaptation, but the importance of mangroves, and problems and issues associated with them. But, the visiting teachers too often want only the ecological study and have to be convinced to look at the issues involved. Similarly, when a teacher visits Fortitude Valley, the urban centre, he or she often wants just to look at Housing, but the centre staff say — What is it like to live in an urban environment? In fact, the fundamental goal of the centres is the broad goal of environmental education but too often there is conflict with the demands of the curriculum.

Mr. Groom of Binna Burra, in Lamington National Park, commented on the lack of success of his Teachers' Guides. He said the handbook and activities on environmental education are far ahead of their time for a teacher who has had no experience of this type of approach — teachers still want nature study. Secondly, many teachers need guidance in field based activities and find it hard work to plan and implement a course without help, especially one so new in approach. Mr. Groom believes that a committed teacher in charge of the Environmental Study Centre would greatly help the programmes to realise their potential.

15.22 Victoria

Victoria has one field studies centre operated by the Education Department, Whipstick at Bendigo, and one or two private ventures, including the newly opened Grampians Environment Studies Centre at Dunkeld. Certain problems have developed at the policymaking level about producing a policy statement on environmental education; the Education Areas remain undeveloped; and the Assisting Supervisor of School Camps believes there is much to be done for teacher inservice to make the camps better vehicles for environmental education.

One Victorian educator interested in the development of environment studies centres in his State believes (personal contact, 1980) that the present network of environment centres, although not extensive, should not be extended at present. There is ample group accommodation in a wide range of habitats, including the school camps, and what is needed, he adds, is an emphasis on increasing the quantity and quality of environmental education in these existing camps. This, as mentioned above, means greater provision for pre and inservice training. A further comment related to the "ideal" centre planned for Victoria (see the reference to Glenewart — alive but too costly — in Chapter 10), the whole idea of an environment centre is that the built centre still enables one to be part of the surrounding environment, and it should be of modest proportions and cost. The present set-back to Glenewart adds emphasis to this opinion that a "grand" centre with excessive costs may not be the best use of limited public funds made available to environmental education.

A husband and wife team setting up a private centre in Victoria believe there is a very real place for privately operated environment studies centres. The private owner/operator often feels more duty bound to ensure that the "customer" is satisfied. But the "system" (does one exist?) should encourage private centres by assisting with expert staffing — perhaps on a secondment basis from the State Education Department or Government Conservation Department, or by subsidizing courses for the public on a per capita basis. A further proposal is for some degree of co-ordination and communication between private and government centres to assist in developing environmental skills to a much higher standard.

Emphasis in this report on the status of field studies centres should not ignore the tremendous support being given to teachers by the Victorian Gould League in helping them to achieve the aims of environmental education in their own schools.

15.23 South Australia

At the grass roots level there is a small but enthusiastic and concerned group of teachers who are looking for the "ideal" for their State. A number of teachers interviewed stated that the ideal for the State in their opinion was a range of models for outdoor education (as they prefer to call it):

1. A small number of the fixed, staffed Arbury Park type centre;
2. A larger number of centres managed and staffed by teachers from one or more committed schools:
3. Suitable areas used as field sites, camping gear and qualified teachers;
4. Environmental advisors in each region to act as a resource pool for inexperienced teachers wishing to use suitable habitats.

The Education Department stated that setting up a team of advisers, in the near future, was financially impossible. It has delegated control of many closed schools to other originally interested schools but development of these is negligible. Is it due, once more, to the lack of enough qualified teachers in the area of outdoor education, or is it a combination of this with lack of finance? In the absence of an official written policy on environmental education, is this area of education being denied a place in the curriculum?

Reference has already been made to the need for a close liaison at top levels between the National Parks and Wildlife Service and the Department of Education.

In South Australia, the spirit is willing, pockets of effective activity exist (where individual schools have worked for a centre), but there is need for a written policy, plans for a co-ordinated network and help for the inactive teacher.

15.24 New South Wales

The development of a field studies centre network in New South Wales has been on an ad hoc basis with systematic planning still not envisaged even in the near or distant future.

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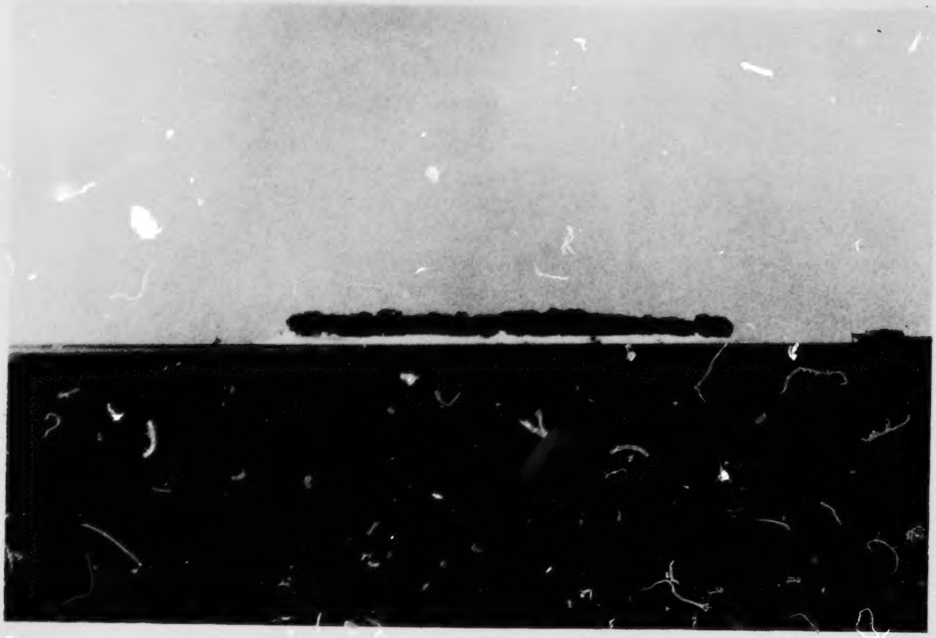


Heron Island has its Biological Field Research Station

Diversity of habitats - the farm dam at Thalgarrah, New South Wales.

Reference has already been made in Chapter 4 to the beginnings of field studies in New South Wales in the early National Fitness Camps. To-day the Sport and Recreation Centres which have developed from the National Fitness Camps have tremendous potential as vehicles for the promotion of environmental education. Factors which contribute towards this potential are:

1. Residential facilities already exist.
2. All ten sites have an outdoor environment with potential for a wide range of field studies.
3. The children are in camp for a period of 5-10 days, thus presenting a greater opportunity for a more lasting impact to be made.
4. The network can cater for a larger percentage of students than the field studies centre network. In 1979, a total of 56,448 students visited the ten centres, 5.5% of the total state school population.

As mentioned in Chapter 4, very little is being done now in the way of effective environmental education in the Sport and Recreation Centres, but a change of policy in that regard is planned for this year (1980).

During the 1940's Minnard Crommelin of Pearl Beach was putting forward the idea of ecological reserves with a field station nearby for research and educational purposes. Allen Strom believes she had in mind increasing knowledge for better management of wildlife and naturalness, and that she was persuaded to the idea following an overseas visit and rather extensive reading of overseas journals. In 1946 she offerred the field station to Sydney University which uses it for students to this day.

During the sixties, when the Fauna Protection Panel began to consider the establishment of field studies centres on faunal (nature) reserves, the field studies centres of Great Britain had already got underway so that the broad use concept of the British field studies centre was contemplated for the Panel's centres. They were to be used by all divisions of the community, from school children to adults. The Panel was abolished before the funds for the first field studies centre were ready to be used. Consequently, the problems of running a comprehensive centre for all manner of interests and ages did not have to be faced. When the Department of Education was persuaded to staff the first such field studies centre — Muogamarra — it was inevitable that only pupils from Government schools should be permitted to use the staff and buildings, and that programmes at the field studies centres should tend to be classroom transferred to an "outdoor situation". It is quite clear, and a pleasing development too, that the science oriented field studies of the early seventies have been replaced, in general, by a broad multi-discipline approach to the environment.

Some further detail on the establishment of Muogamarra seems relevant in order to point out how innovations proceed slowly and somewhat at random. Moves to establish two centres were initiated in 1964 by the Fauna Protection Panel (Allen Strom was Chief Guardian of Fauna), one at the Sir Edward Hallstrom Nature Reserve, Cowan, and one at the Barren Grounds Nature Reserve. The money was granted to the Fauna Panel to establish a centre in the Hallstrom Reserve, but not at Barren Grounds; plans were made to place the Hallstrom centre alongside the Ranger's residence at what is now called South Muogamarra. Since the ideal situation for the building was just outside the Reserve, negotiations proceeded for the acquisition of an area of Crown Land. However, by this time, 1967, the Fauna Protection panel had ceased to function with the establishment of the National Parks and Wildlife Service. The Service acquired Muogamarra Sanctuary and added it to the Sir Edward Hallstrom Nature Reserve, calling the entire area Muogamarra

Nature Reserve. However, even though the Service accepted responsibility for the establishment of a centre, using the money originally set aside by the Fauna Panel, the site for the building was chosen in the North Muogamarra area, a position thought by some to be not as ideal as the original South Muogamarra site.

The Education Department was then approached to supply a teacher, and after some deliberation, a precedent was created in the appointment of a teacher to the centre in 1973, the justification being that the field studies centre became a School for Special Purposes. To-day, field studies centres staffed by Department of Education personnel are classified as Class 4 Schools for Specific Purposes.

Reference to Section 15.1 of this chapter, and to the breakdown of centres in New South Wales in terms of management, shows the monopoly by the Department of Education both in terms of staffed centres and closed schools. However, it has also been pointed out that the network is inadequate in terms of meeting demand and in servicing even a minor percentage of the total school population. But is an expansion of field studies centres the answer to a need for greater promotion of environmental education?

The greater number of the field studies centres in New South Wales grew up because:

1. The closed school was there.
2. The district inspector or the local community supported the idea.

Such questions as the following should have been and still should be asked:

1. Is this field studies centre so placed that a satisfactory number of schools can be serviced, all within easy transport distance?
2. Will this field studies centre experience provide something for the children which they cannot obtain in their local area?
3. Is this field studies centre within an environment of diverse habitats that can provide, over 3-4 days at least, a range of experiences which will include the expanded view of the environment?

The Riverina Region in New South Wales does not have a field studies centre and perhaps, for this region, a field studies centre is not a solution to school needs. The region is a large one, environmentally diverse, and one field studies centre, which would be the offered solution, would not service the region either in terms of a useful experience or in terms of numbers. It is possible that the Riverina may establish a team of environmental consultants and this could be cheaper and more effective than a number of fixed, staffed field studies centres.

Lack of provision for the community is a fault in New South Wales as in other states. However, some promising pockets of activity do exist and these may snowball when the economic and political climates are right.

Mention has been made of the interest taken by the National Parks and Wildlife Service in promoting environmental education and the establishment of field studies centres for the general public.

The Planning and Environment Commission has set aside land in Homebush Bay for the establishment of a field studies centre but the Commission is waiting for help in terms of finance and manpower from other government departments.

Community activity in the district around Narrabeen Lagoon has led to the formation of a Narrabeen Lagoon Management Committee, and part of its policy is to investigate the possibility of establishing a field studies centre with liaison between the Education Department and the National Parks and Wildlife Service.

The establishment of the Awabakal Field Studies Centre in Newcastle is an excellent example of community interest and pressure. Some background history in this community involvement may be of interest.

1966 The Newcastle Flora and Fauna Protection Society proposed a natural park and field study area for the coastal land from Redhead to Jewells Swamp.

1974 There were renewed attempts to secure a Field Study Centre in the Newcastle area. Initiative was teken by a group (mainly teachers) in conjunction with the Department of Education.

1975 A Public Meeting was called at the instigation of Mrs Betty Roberts (Inspector of Schools) to establish the "Awabakal Field Study Centre Association". At this meeting, held 30th April 1975, an interim constitution was adopted and election of officers held. It was at first proposed to call the Association the "Awabakal Field Studies Association" but the title "Awabakal Association for Environmental Education" was adopted at the first Committee Meeting.

During 1975 several public "orientation field days" were held to acquaint members and visitors with the area, and to begin the detailed documentation of the natural history of the area. These were well attended by family groups, though schoolteachers showed greatest interest.

From 24th November 1975 until the end of the year, the Department of Education seconded a teacher, Mr. Boris Sokoloff, as a temporary adviser in Environmental Education to prepare resource materials and foster use of the "Awabakal Field Study Area" by visiting classes of school students.

1976 During 1976 much documentation and publicity material was prepared on the area and on conducting field studies. This effort was mainly undertaken by members of the Association in their own spare time. Additional inservice courses were conducted. In March an old portable classroom was transported to a one-acre site acquired by the Department of Education adjacent to Dudley Public School. "Trail Days" and "Working Bees" were conducted on weekends throughout the year.

26th June 1976 marked the commencement of intense efforts to secure the land between Dudley and Redhead as a Nature Reserve for educational purposes. A letter was sent to the Minister for Lands. The Association took up the matter with the local Member, Mr. Richard Face, M.L.A. who worked tirelessly for the Association's objectives. Other community organisations supported the moves to have a teacher-in-charge appointed to the Awabakal Field Studies Centre and for the land to be declared a Nature Reserve. The position of teacher-in-charge was advertised in the Education Gazette of 3rd August 1976.

During the year, several members of the Association cleaned the building (the portable) and mowed the lawns nearby, thus demonstrating keen community support.

The Awabakal Association also entered into the issue of silica sands mining at Dudley Bluff, opposing the mining as inimical to the proposed Nature Reserve. This issue became protracted and involved much time and effort. The Company was finally granted approval to mine, but stringent conditions were imposed.

On 13th August 1976, the Awabakal Field Studies Centre was officially gazetted.

On 11th October 1976, Mr. Brian Gilligan commenced duties as teacher-in-charge of Awabakal Field Studies Centre.

Towards the end of the year, the Awabakal Association began to encourage a wider view of "environmental education" to include urban studies, involvement in issues such as the impact of off-road vehicles on the environment, etc.

On 9th November 1976, the Minister for Lands announced that he would dedicate 121 ha. of coastal bluff country between Dudley and Redhead as a Nature Reserve.

It can be seen then that there was strong community (and media) support for the establishment of a Field Studies Centre in the Newcastle area. Mr. Kevin McDonald, President of the Awabakal Association for many years, comments on the present situation. He reports that with the achievement of most of the initial objectives, namely:

— establishment of the Centre
— appointment of a teacher-in-charge
— dedication of the land as a Nature Reserve

interest in and support for the Association has declined. This decline, he believes, mirrors the parallel decrease in support and participation for the environmental movement generally.

Another factor is that environmental action has become "institutionalised" to a large extent. The public has witnessed the acceptance on the part of the Department of Education to institute programmes in environmental education and there is no longer the same "sense of urgency" that "something ought to be done".

The achievements of the Awabakal Association in establishing the field studies centre will remain as an example of what can be done when sufficient members of the public feel sufficiently strongly about a social need or challenge.

There is a real need for the Awabakal Association to continue in existence. But the direction of its effort should change from one of support for the formal education sector to support for some kind of organised programmes for the general public, whether based at Awabakal Field Studies Centre or elsewhere. At the present time the public are making regular use of the Awabakal Nature Reserve for recreational walks; various groups make use of the centre's facilities for informal barbecues. But this kind of involvement is not enough.

In summary, the following comments about New South Wales are important:

1. The Department of Education field studies centre network has developed on an ad hoc basis and future planning to rationalise the system is not envisaged.
2. A lack of co-ordination exists for the whole network, government and private.
3. No further expansion of Education Department centres in New South Wales should take place until a policy is formulated and a rationale developed for their existence.

4. Programmes in field studies centres have developed from a rigid scientific approach to a broader based approach, but there is still progress to be made, in some centres at least, government and private, towards achieving the broad goals of environmental education as stated in the Belgrade Charter.
5. There is a lack of provision for education of the general public.

15.25 Tasmania

Tasmania as a State has not yet come of age as far as environmental education is concerned. There are individuals, in isolated pockets, who see the need for a united front with a clear statement of objectives, and nowhere is this need for co-ordination more necessary than in the field study centre network.

The staffed field study centres, by virtue of the programmes offered there, are true proponents of the broad vision of the environment, but these centres are few in number, and the total field study centre network with its unstaffed "camps" and individual school centres, falls far short of its actual potential.

The network of field study centres has developed ad hoc, with never enough resources to develop it properly, and with no clearly stated policy statement to direct that development. A Committee on Outdoor Education Experiences (COOEE)was set up in 1974 to act as a policy making body, and included in its recommendations were three statements on field study centres. Members of that early COOEE committee in 1974 saw as their future goal (pers. comm. 1980) the establishment of at least twenty centres throughout the State, each centre with a different focus related to the particular environment in which it was placed. In 1975 the first centre was established at Waddamana.

In 1976, the already existing National Fitness Camps, such as Port Sorell and Coningham, among others, came under the control of the newly established Division of Recreation (within the Department of Education), so that the Education Department found itself in control of the camps, now loosely labelled "field study centres". The original intention to develop strategically placed, single focus centres gave way to multi-purpose centres, unstaffed, where teachers come in with their own programmes, 75% recreation and perhaps 25% environmental studies.

In 1980 the various centres operate under a variety of controls: among the staffed centres, Woodbridge and Molesworth are answerable to the Regional Superintendent; Waddamana is controlled by the Division of Recreation. The Recreation Camps (Sorell, Coningham, Esperance and Rheban) belong to the Division of Recreation, and at least six High Schools support their own field study centres. A number of educators in Tasmania agree that the network needs a planned expansion, but the Division of Recreation has Community Development as its main priority, and one is led to ask whether the co-ordination and planning of the field study centre network as a whole should be given priority by at least two full-time staff members, or be passed over to someone in the Curriculum Centre who can be an Environmental Education Officer fully responsible for the total field study centre network (seconded help would be necessary). One advantage served by keeping the control in the hands of the Division of Recreation would be the possibility of developing community field study centres or at least developing community programmes in the existing centres. As in all States of Australia, lack of adequate staffing would be the major obstacle.

A need for planning in the network is seen to involve:

1. A greater diversity of sites; too many of the present centres are in marine environments. A need exists for a centre in
   - (a) the west coast
   - (b) an urban environment
   - (c) Maria Island (negotiations with N.P.W.S. have lapsed)
   - (d) Lake St. Clair
2. Permanent staff for all the centres; until this is achieved, the present network cannot realise its potential.

The potential for community environmental education at Lord Howe Island is enormous.

CHAPTER 16 - PLANNING FOR THE FUTURE:

It is time to ask where we should be going in terms of our field studies centre network. This will be discussed under three headings:

1. Expansion of the present network.
2. Modification of the present network.
3. Planning the ideal field studies centre.

16.1 EXPANSION OF THE PRESENT NETWORK

16.11 General Comments:
It is clear that demand at the grass roots level exists all over Australia for children to be given a field studies centre experience, either with expert staff at an established centre, or with well trained teachers from their own school. The 1979 Annual Report for the Wambangalang Field Studies Centre in western New South Wales included the following comment about the future:

> "The growing demand for Environmental Education activities throughout the Western Region has not only ensured the continued success of the Wambangalang Field Studies Centre but has also raised the question regarding further development of field studies centres. "In my opinion, there is a desperate need for a second field studies centre in the Western Region of New South need for a second field studies centre in the Western Region of New South Wales. In addition it appears that the need for further teaching staff assistance is rapidly becoming obvious. The demand for Environmental Education throughout the region cannot be answered by two teachers from one location".

In spite of this request, which could be repeated in several other regions of New South Wales, it would appear that expansion of the network, in New South Wales at least, as it exists and operates at the present time, is not a recommendation of this report. Reference has already been made in Chapter 15 to such concerns as:

(i) monopoly by the Department of Education
(ii) lack of provision for the general community
(iii) failure by some field studies centres to work towards the objectives of environmental education
(iv) lack of training for centre staff (except in Queensland)

The recent moves by the National Parks and Wildlife Service to set up a field studies centre in Bouddi National Park, an operation independent of the Education Department, is a highly commended innovation — a centre to be open seven days a week, a centre available to independent schools as well as state schools, and available also to members of the public. The success of this venture will depend to a marked degree on the kind of person appointed to act as warden and consultant, a person to be paid by the N.P.W.S.

In every state, the present network is inadequate for both student and community needs, but it appears that each system, as it stands, should not be expanded until the centres in operation are being used more effectively in terms of:

(i) establishing a broader base
(ii) working towards the goals of environmental education as outlined in the Belgrade Charter.

Of course it should be said that certain centres in Australia are working towards such effectiveness — Awabakal, Bournda, Wambangalang and Muogamarra in New South Wales, Arbury Park in South Australia and many of the Queensland centres. But until a number of changes occur within the present system, expansion of the "formal" field studies centre network is not a viable proposition.

Expansion of the "informal" field studies network, along the lines of the American community nature centres, should be a goal to work towards, but several of the modifications relevant to the Education Department network are also relevant to the informal sector.

Proposals for modifications to the present system in New South Wales were discussed with Mr. Frank Haddon, Environmental Education Consultant for the Department of Education. These include, in order of priority —

1. A clear policy on environmental education, possibly at a national level, but certainly at State level.
2. A permanent body of people in each State to co-ordinate environmental education activities, a statutory body with representation from such bodies as the N.P.W.S., Department of Education, Planning and Environment Commission, State Pollution Control Commission, etc.
3. A regional consultancy network such as teachers on day release to be used where they are most effective.
4. Key people in schools to represent or co-ordinate environmental education activities within the school-based programme.
5. The capacity to make resources available to schools, e.g. slide sets, activity booklets.
6. Expansion of the field studies centre network **after** careful consideration of the need of each centre:
    - (a) Why is the centre to be established?
    - (b) What are its objectives?

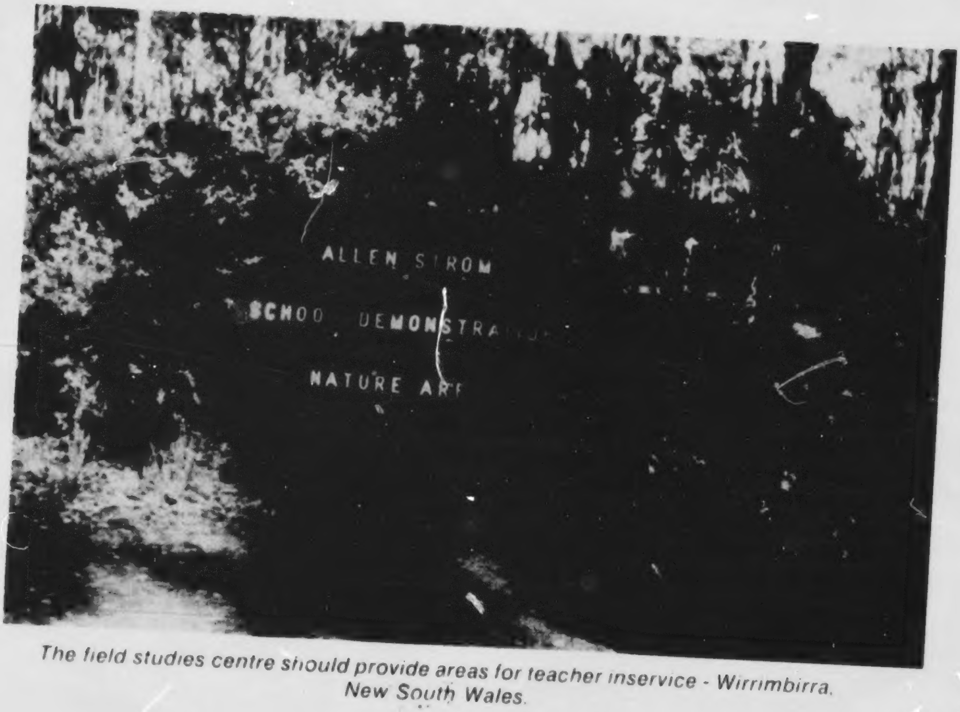
16.12 Strategy Plan Presented by the Curriculum Development Centre

In 1977, the Curriculum Development Centre in Canberra produced a publication on the Development of Environmental Education in Australia — Key Issues. In outlining a developmental strategy, reference was made to the establishment of environmental study centres, and since the proposal was for centres adopting a much broader role than any centres have at present, it seems appropriate to include an extract from the publication (Pages 49-50).

> "Curriculum development and environmental agencies should promote the development of a network of educationally suitable sites and facilities on a regional basis. This network would facilitate student experiences within the local area (for example 'environmental encounters', walkabouts, mapping and planning activities, field studies and environmental investigations), excursions into the local region, the provision of a range of life-style experiences and the development of environmental study centres.

does your dinner table ever look like this?

Signs should be clear and stimulating. Sign at Kalkari, Sydney.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The field studies centre should provide areas for teacher inservice - Wirrimbirra, New South Wales.

"Environmental study centres would be a key feature in the creation of this network. In rural areas, existing environmental study centre facilities should be assessed and supported where necessary and new centres could be developed if required. Similarly, environmental study centres located in urban areas should be developed. In older urban areas such environmental studies centres could be integrated into redevelopment proposals or existing civic facilities. New urban study centres could be incorporated into future regional complexes at the planning stage.

"Considerations should be given to providing specific financial assistance to enable environmental study centres to be established throughout Australia. Such assistance has been recommended previously by the House of Representatives Select Committee on Wildlife Conservation and the Committee of Enquiry into the National Estate. Such financial assistance should be designed to encourage the use of environmental study centres by organisations other than those involved in formal education.

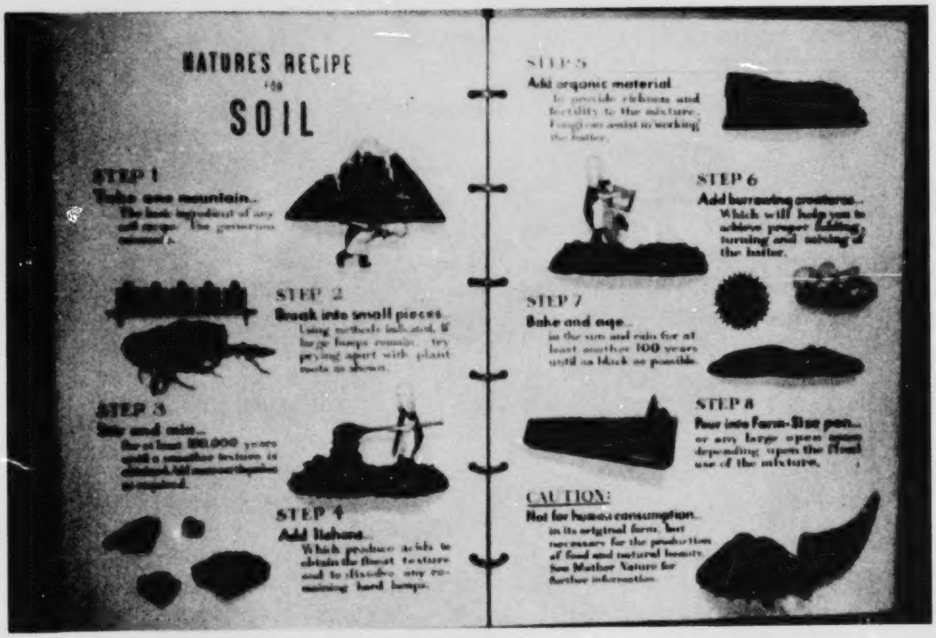
"It is suggested that the functions and activities of environmental study centres should include: .

- the development of environmental resource inventories. These would include detailed information on available sites and facilities, personnel and relevant services, materials and teaching aids, and might also provide information on recent patterns of use. The development and maintenance of these inventories should be the responsibility of the regional environmental education consultant, and the relevant information would be kept at both regional and the national environmental education information centre.
- the encouragement of workshops to co-ordinate approaches associated with field experiences. The regional consultants should participate in these workshops, though they need not necessarily take responsibility for their organisation.
- research to determine the most appropriate forms of outdoor experience for children at various levels of understanding and ability. This research should be understanding and various levels of understanding and ability. This research should be undertaken either by an evaluation team or by independent groups or individuals at schools, universities or other institutions, with financial and logistical assistance from the Education Research and Development Committee, the Curriculum Development Centre or the Schools Commission within their respective areas of responsibility".

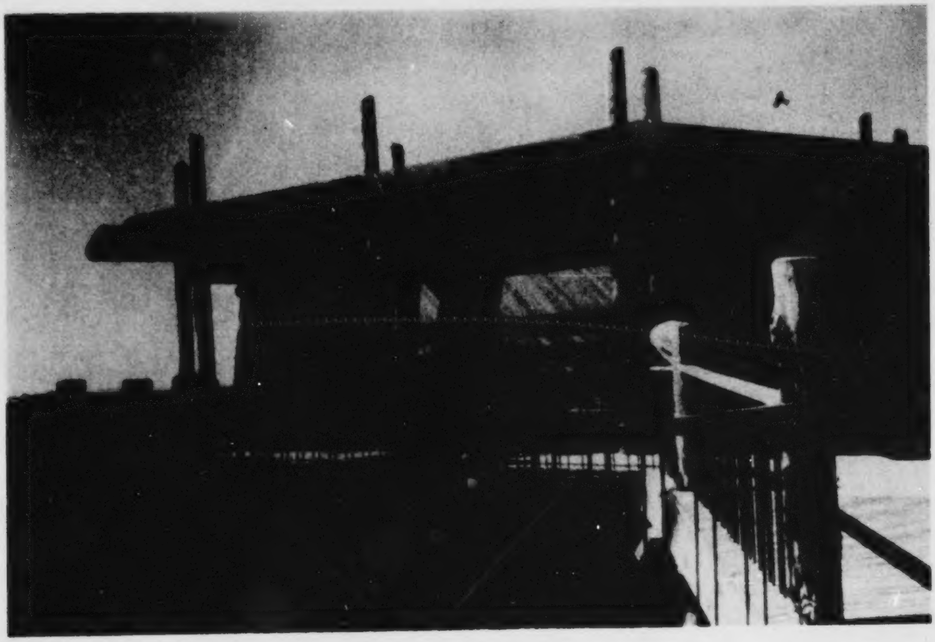
The question which comes to mind in 1980 is, Why has there been no development in this area, why no implementation of the strategy plan outlined above? The only explanation seems to be a political one. The publication mentioned above was based on a report prepared by the Curriculum Development Centre Environmental Education Committee, which was established as a special committee of the Curriculum Development Centre by the then Minister for Education, Mr. Kim Beazley in December, 1975. With a change of Federal Government in 1975, support for environmental education had to take its place among other pressing priorities.

16.13 Expansion in Particular Areas

The Northern Territory has particular needs and problems with respect to development of a field studies centre network. Firstly, centres in the Territory would need to be residential because of:


NATURES RECIPE
FOR
SOIL
STEP 1
Take one mountain..
STEP 2
Break into small pieces..
STEP 3
Stir and mix...
STEP 4
Add lichens..
STEP 5
Add organic material
STEP 6
Add burrowing creatures...
STEP 7
Bake and age...
STEP 8
Pour into Farm-Size pan...
CAUTION:
Not for human consumption..

Attractive and interesting displays. This one is at Tilden, San Francisco.



The rustic design of the Baylands Centre. Palo Alto. California.

Looking at a midden on the magnificent coastline adjacent to Bournda Reserve, New South Wales.

Facilities at Sunday Creek Field Study Centre.

(i) the vast distances to be travelled
(ii) discomforts of camping in the Territory climate
(iii) specimens need to be studied almost immediately because of the difficulty of preservation in high temperatures. Therefore there would be a need for facilities such as a deep freeze and equipment with which to carry out all kinds of laboratory studies in situ.

Secondly, a serious drawback exists with finance in the Territory because a centre there would need so many more facilities (e.g. air conditioning, generators, deep freeze) that the cost may be almost prohibitive.

Thirdly, a centre in the Territory would need to be in such a location that would ideally enable it to be an all-weather centre, not one that would be inaccessible in the wet.

Even with plans to build a community field studies centre in Kakadu, it would seem that more centres are necessary even if only to spread visitor damage — a few smaller ones would relieve the impact. On Page 210 of the Fox Report it was proposed that the activities of tourists should be strictly controlled throughout the Alligator Rivers Region. At first this may be essential, but surely not only wise interpretation but a sound educational programme is the answer to tourist vandalism, which is often the result of ignorance. A field studies centre could cater for interested members of the community with 1-4 day programmes aimed at appreciation, understanding and responsibility towards the assets of the area. Success with early courses, together with wide publicity, could draw in the "fringe — dwellers" to heighten their awareness and hence their sense of responsibility towards both the natural area and the Aboriginal cultural heritage.

Mr. Harry Penhall of School Camps Branch in Victoria has a plan — if he had 15 million dollars to spend. He would develop certain camps, residential, to take in teachers and children, with the teachers there for training. He believes that with a permanent group of expert staff, he could operate eight — week inservice courses to upgrade the present programmes of school camps. His plan would cover the following areas:

1. Lake Eppaloch (inland)
2. Mildura (in the Mallee)
3. Alpine area for a mountain training school
4. The coast
5. An urban situation

16.2 MODIFICATION OF THE PRESENT NETWORK

16.21 Reappraisal of Policy and Objectives

While it is acknowledged that certain centres in Australia have established a broad base of operations which works towards objectives such as finding man's place in the total environment, and his responsibility towards it, it is clear that other centres are still functioning on a "nature study" level. A new look must be taken at the reasons for the field studies centre experience, staff must be those with the broad vision, policy must be set at high administrative levels, and a sound rationale for the placing of centres must be adopted.

16.22 Teacher Inservice

The field studies centres, particularly in New South Wales, see teacher inservice as one of their major roles, but their admirable efforts must be just a drop in the ocean, and more so in the other States (except Queensland) where few staffed centres exist and the common cry is for more inservice for environmental education.

In Western Australia, the environmental education officer wants to see the field studies centres being used for teacher inservice and workshop sessions to write programmes.

In Victoria, the Schools Camps Branch sees inservice of teachers as a must for the camping programme to realise its potential in the area of environmental education.

16.23 Community Use

In New South Wales the Sport and Recreation Centres are being widely used by the community but mainly in terms of cheap accommodation for leisure pursuits.

The Government field studies centres in New South Wales are also moving towards greater community use. However in practice this is developed to differing degrees depending on the particular centre and its involvement with a community group.

However, the present network needs to cater for community needs much more so than at present, by making the centres available at week-ends with staff possibly on a trained volunteer basis.

16.3 PLANNING THE IDEAL FIELD STUDIES CENTRE

16.31 The Ideal Centre

Around Australia and overseas, the question has often been asked, Have you found the ideal centre? What is it like? To this question there is no single answer, and no simple answer. One has to follow it with another question — ideal for whom? And not only must the planner keep his audience in mind, but plan with the objectives of the centre in mind as well.

Jack Althaus of Queensland, when asked about his ideal centre, answered that Sunday Creek Field Study Centre, in his opinion, has the most potential for field studies. He said (pers. comm. 1979), "To my mind the single main attribute that Sunday Creek offers above other centres is the unique wilderness setting which gives those who visit a chance to come to grips in a real sense with the Australian environment as it could have existed prior to settlement". Mr. Althaus is adamant that the ideal experience should not be a four-day stay in motel-type accommodation — at Sunday Creek the children stay in tents, and the Forestry barracks, galleys, storeroom and residential cottages blend in with the setting. Water is reticulated from a well and hot and cold showers are available. At present earth closet toilets are used but plans exist to develop an ablution block to include W.C. facilities. Cooking can be done indoors, in galleys, or in the open.

The variety of habitats is extensive — including open forest, rainforest, creek, gully, mountain, gold-bearing reefs, open grazing and man-managed forest plantations. Bird life (including the resident Bell Bird colony) is magnificent in both numbers and diversity. Other forms of animal life are as varied and numerous and include, among others, deer, wallabies, possums, bandicoots, snakes, echidnas, wild pig.

Mr. Althaus' objective is to have a centre where children live through a wilderness experience.

Bournda Field Studies Centre in New South Wales is a centre with tremendous environmental potential — its diversity of study sites is immense. But the centre is badly placed for access; few schools have easy access — the A.C.T. schools are closest but are not allowed to visit; schools in Wagga Wagga have to come over the range. In short, if access was better, the centre could accommodate more clients than are actually visiting now. Furthermore, the facilities are not ideal. The centre itself is stationed at Jellat Jellat closed school, while the residential hut, built by local volunteers, is miles away in Bournda Reserve. Bournda is an example of bad planning as to the choice of the actual site.

Another problem concerning location is the siting of Muogamarra Field Studies Centre, in New South Wales, in a Nature Reserve. While it is commendable that the reserve is being used for educational purposes, adults, many encouraged by their children who have visited the centre, try to enter at the week-end when the Reserve is closed. If a field studies centre is placed in a closed reserve, ideally there should be a ranger on duty at week-ends so that programmes can be available to the general community. Here the American idea of the trained volunteer would be of considerable help.

Following are some points relating to the ideal centre:

1. Diversity of study sites as at Bournda and Yarrahapinni (New South Wales)
2. Reasonable access for a large number of population centres; preferably at a rail head.
3. Diversity of facilities available as planned at Ravensdale and Yerranderie (New South Wales).
   - (i) bunk type rooms for those who want to be comfortable (a number of adults)
   - (ii) tents on site with facilities available
   - (iii) campsites — art students at Ravensdale go out from the Centre to campsites in the forest — small tents and no facilities
4. On-site full-time staff — centre staffed seven days a week and available to all sections of the community.
5. Should function as an inservice centre where teachers can obtain new ideas e.g. the displays and aquaria at Muogammarra (New South Wales).
6. Can function as education in alternative living or education in basic resources such as the vegetable garden and orchard at Stanley River (Queensland), and the conservation of energy designs in the proposed centre, Glenewart (Victoria).

Alan Reid (Victoria) suggested that the "ideal experience" should be one based on a number of field experiences such as:

(1) Visit to an established centre such as Arbury Park (South Australia) or a Department of Education Centre as in New South Wales.

(2) Wilderness experience as at Sunday Creek (Queensland) or Whipstick (Victoria)

(3) (a) inland

(b) at coast using a campsite with individual school staff.

16.32 Planning a Field Studies Centre

A field studies centre has four basic elements — land, buildings, people and programmes.

Land

1. Ideally the land should be as varied as possible to allow for a diversity of studies, to maintain interest in all kinds of people, and to allow for lay-over areas which prevent over-use.
2. The size of the centre will depend on the availability and cost of the land, as well as estimates of the number of visitors it must accommodate in the future. Successful centres in the United States range in size from 50 acres to well over a thousand acres, but the most recent reports indicate that two or three hundred acres is a satisfactory minimum.
3. In times of rising transport costs, a centre should ideally be placed at a rail head.
4. The site for the main building, allowing for due regard to levels for drainage and foundations be so placed that the interior can be part of the outdoors by allowing for the maximum window space possible (due consideration being given to the outlook and adequate wall space for displays and notice boards).

Programmes

After acquisition of the land, the most sensible approach is to plan the programme and then fit the building to aid that programme. The plan of activities and the development of the property and buildings should be related. It cannot be too heavily stressed that people familiar with the proposed programme and with school and community visitor needs must be in liaison with the architect. Thought must be given to:

1. An attractive and spacious assembly area.
2. Enough wall space for exhibits and notice boards.
3. An entrance area which can cope with thirty wet or muddy children.
4. Space for loan material if this service is to be part of the programme.
5. Space for workshops and laboratory work as follow-up to the field work. Ideally the audio-visual area should not be in the same room as the work benches because this limits the flexibility of the programme.
6. The possibility of special programmes for the handicapped.
7. The use of the centre for teacher inservice or management demonstrations, e.g. orchard, beehives, aquaria and terraria, artificial ponds, structured nature trails, farm garden plot, nursery, compost pile, wildlife or forest management practices.
8. Outdoor assembly areas — log seating, space for campfire.

Buildings

1. The main building should contain space for exhibits, a library, office, restrooms, an assembly room (which can double for audio-visual displays) and a visitor workshop or laboratory.
2. For a number of reasons, including maintenance and security, it is helpful to have one or more residences on the grounds.
3. Observation structures built at the edge of lagoons (e.g. bird hide) add to the usefulness of the centre.
4. Maintenance and storage space is essential either inside or outside the main building.
5. A variety of trails should be developed with perhaps interpretive signs.
6. Parking space for buses and cars should be provided.

7. Working space for the staff is essential — preparation and printing of written materials, preparation of interpretive devices and exhibits.
8. If possible, toilet facilities should have access to the outside and the interior.
9. An elevated walkway constructed on driven poles carries observers over a swamp, mud flat or water's edge, and permits extensive observation of the littoral zone without any destruction of the habitat.

People

1. The success or failure of a field studies centre may depend on the quality of its staff. A centre ideally needs a trained educational director, one or more assistants, a secretary and a caretaker or groundsman.
2. Hopefully a community centre will attract visitors of all ages, both as individuals and in groups. Planning should consider the needs of individuals who want to take a nature trail with guide notes, school children of various ages, week-end family groups, the handicapped, adult group leaders, college and university students.

16.4 BAYLANDS INTERPRETIVE CENTER:

How does this center in California measure up to the guidelines for planning a field studies centre?

The Baylands Center is strategically placed in a diverse land area on the bayward side of Bayshore Freeway in Palo Alto. Included in the study area are salt marsh preserve, flood control basin, yacht harbor, salt water lagoon, duck pond, airport, commercial and industrial sites, golf course, athletic center, sewage treatment plant, recycling center and refuse disposal area.

Not only does the area include unique natural areas but here, too, people can see the profound effects that Man's activities can have on the natural world, and can see the importance of balancing open space needs and economic considerations.

This center was designed by an architect who had an empathy for marshes; it sits above the marsh surrounded by an open deck from which visitors can view the area; the boardwalk over the marsh covers a total of 3km and protects the habitat from tramping feet; full-length windows open out on to the marsh scene; a separate laboratory area allows materials to be set out for use any time of the day; 5cm x 15cm floorboards are placed edge up — ideal for maintenance in a mudflat environment; the walls are rustic, roughened timber; the design is functional and aesthetically pleasing.

The center is open seven days a week, and activities for schools and community include nature walks, laboratory workshops, lectures, seminars, research, films, and fieldwork such as netting and seining in the lagoon.

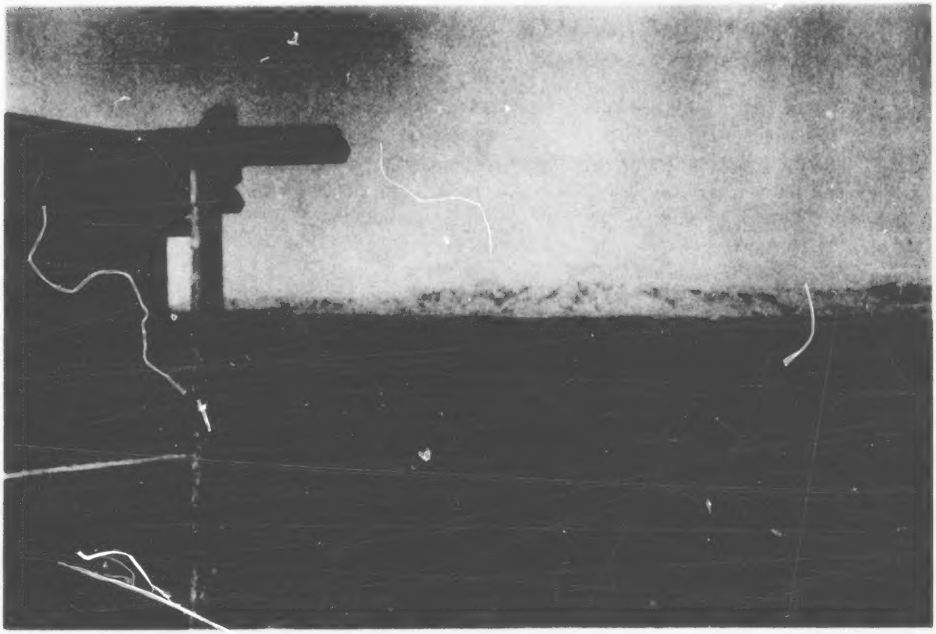
Staff includes the Director, John Walton, and his assistant, both trained naturalists, and support to keep the center open seven days a week comes from a group of thirty trained volunteers. The center was built at the request of local community groups and the residents of Palo Alto, and the City of Palo Alto pays the staff salaries.

This center is functional because —

1. Its design and programmes are based on its objective — to develop in the general community an awareness of the vanishing wetlands so that people can make decisions based on knowledge.
2. It caters for all members of the community with programmes of varying depth; visitors include not only school children, college and university groups, but family groups and residents from all parts of the western side of San Francisco Bay.
3. It is ideal for this particular environment — its design, building materials, construction, and harmony inside and out.

Conclusion

While it is acknowledged that a field studies centre is a base from which visitors go out to work in the field, it must not be forgotten that the initial introduction to the outdoor experience is within the assembly area of the field studies centre. All people, especially the young, are sensitive to their surroundings, and it should be by intention that the centre itself is aesthetically pleasing, clean and bright, with efforts made to produce first-class exhibits (periodically changed), labels and signs that are accurate, interesting, attractive and easy to read, and no signs which read,"Do Not Touch!"



The marshes and the broadwalk at Baylands Centre, Palo Alto, California.

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CHAPTER 17 — RECOMMENDATIONS:

Following are a number of recommendations which aim to strengthen the work being done in Australia in the area of environmental education.

17.1 FINANCE

Efforts for expansion and upgrading of facilities and staffing are hampered in all States by lack of finance. It is recommended that Federal assistance be given to the Education Department, National Parks and Wildlife Service and private ventures in all States, specifically labelled for promoting environmental education through the establishment of field studies centres.

17.2 POLICY

17.11 Government Level

It is recommended that at Federal or State level, governments accept responsibility to promote community environmental education through the establishment of a statutory Environmental Education Council.

17.12 Department of Education

(i) It is recommended that those States without a policy statement on environmental education be urged to develop such a policy, with supporting documents, to help promote the implementation of programming in environmental education in primary and secondary schools.

(ii) It is recommended that in all States a joint policy be developed at top levels between the National Parks and Wildlife Service and the Education Department to make available the expertise and facilities of each authority in working towards the common goal of environmental education for the whole community.

17.13 National Parks and Wildlife Service

It should be pointed out to the N.P.W.S. in certain States that this body realise the potential of its estates and personnel and assume some degree of responsibility for the education of the adult community in particular, and not accept the act of interpretation as a sufficient effort to meet to-day's needs.

17.3 EXTENSION OF CENTRE NETWORK

In general, each State is not catering adequately for the school population, and certainly not for the adult population. Specific recommendations include:

1. That the National Parks and Wildlife Service in New South Wales establish field studies centres in the following areas because of their excellent potential for environmental education:
    (a) Captain Cook's Landing Place
    (b) Yarrangobilly Resthouse (Caves)
    (c) Flynn's House, Macquarie Reserve
    (d) Warrumbungles National Park
    (e) Kinchega Woolshed
2. That, due to its enormous potential and its high tourist intake, the authorities on Lord Howe Island consider the establishment of a field studies centre there, based on the community interest that already exists for such a project.

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FIELD STU
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Is this small portable classroom adequate as a base for all the activities of a field studies centre?

Students at Heron Island, Queensland.

3. That consideration be given to the establishment of a community field studies centre on Phillip Island (Victoria).
4. That the Schools Camping Branch in Victoria consider —
   (i) the conversion of some existing camps to be inservice centres with laboratory and teaching facilities
   (ii) the improvement of facilities at school camps to enable more effective teaching in the area of environmental education — better equipment and laboratory type rooms.
5. That either the Land Conservation Council or the Education Department in Victoria take the initiative to develop a master plan for the Education Areas to promote environmental education programmes.
6. That in all States, centres operated by the Department of Education or by the National Parks and Wildlife Service be available to both government and non-government schools and to the whole community.
7. That if field studies centres for schools and community are going to be a viable proposition in the Northern Territory, co-operation is needed at executive level between such bodies as the Education Department, the Northern Territory Tourist Board and the Territory Parks and Wildlife Commission.
8. That the Education Department in Darwin consider plans to set up a number of centres at sites such as:
   (i) Channel Island
   (ii) Katherine
   (iii) Alice Springs

   allowing for exchange of pupils between the Top End and the Arid Zone.
9. That the Australian National Parks and Wildlife Service consider the establishment of a community field studies centre at Uluru (Ayers Rock) to cater for courses extending from one to three days.

17.4 TEACHER TRAINING

1. It is recommended that all States with Education Department staff in field studies centres consider the benefits to the staff and visitors to the centres if the centre staff undergoes a training programme similar to that operating in Queensland.
2. It is recommended that the Department of Education should release selected teachers from their schools in various States to attend tertiary institutions for undergraduate and postgraduate courses in environmental education. Suitable courses already operate in Colleges of Advanced Education in South Australia and New South Wales.
3. It is recommended to the Department of Education in every State that more attention be given to the possibility of providing an adequate number of inservice courses in field studies and environmental education for the classroom teacher.

17.5 RESEARCH

It is recommended that finance be made available to study the characteristics of development in children in grades K-12 as this relates to environmental education programmes. It is essential to know whether our efforts in schools and field studies centres are being concentrated on the primary children, who may not be capable of forming an appropriate value system, or possess the necessary degree of problem-solving skills. Is the primary child capable of rational decision-making and the art of compromise in relation to environmental issues? What are the most appropriate environmental education programmes for primary and secondary children assuming that differences exist in their ability to deal with environmental issues?

CHAPTER 18 — CONCLUSION

18.1 Questions Presented by the Study

A number of questions were posed as part of the objective of this study. They are:

1. Is the concept of a field studies centre as a worthwhile educational experience a valid one?
2. Are natural areas being sampled wisely by the total field studies centre network in any one State?
3. Is the present network fulfilling educational needs? How far does the expansion need to go?
4. Do field studies centres need to be in National Parks?
5. Are the field studies centres showing a pattern of development that is consistent with a wise use of resources?
6. Are the field studies centres staffed by New South Wales education officers achieving their objectives as they relate to visiting school children?

1. Is the concept of a field studies centre as a worthwhile educational experience a valid one?

If one accepts that there is value in environmental education, one must accept the fact that there is value in field studies centres. Firstly, given the premise that humans are part of the natural and man-made environments and there is constant interaction between the two; secondly, given the premise that the earth's resources are finite and wise management is vital for future quality of life, then it follows that it is imperative to provide for the kind of education that is an adequate preparation for life in the year 2000.

Environmental education is seen as achieving its goals by a total experience of the environment, with the child using that experience as a base for all types of curriculum activities. Throughout the whole of Australia, the same needs were expressed:

(i) the teachers in the classrooms *to-day* lack knowledge and confidence to use the environment as they so desire
(ii) finance is not available to engage an adequate number of consultants in environmental education to service all the schools in every State
(iii) the local environment of many schools offers limited scope for study.

The field studies centres experience where
(i) the centre has trained staff
(ii) the visit is for at least 3-5 days is an essential experience for

Teachers, where they gain help to

- conduct their own field excursions
- develop environmental education programmes within their own schools
- influence the long-term development of desirable pupil attitudes towards the environment
- assess the potential of other areas, including their immediate school environment for undertaking environmental activities.

Students, who can

- have the opportunity to widen their experience and see a contrasting environment
- take part in a learning and social experience free from the constraints of the classroom.

The general public, who should be the decision-makers on environmental issues. The centre's own staff will acquire considerable expertise on local issues, and there is no reason why this should not be available to a wider audience than just school children.

However, it should be pointed out that certain educators (in South Australia in particular) see the field studies centre concept as a valid one, but limiting. Environmental education can proceed according to other models such as the use of any natural or manmade area by the experienced and confident teacher.

2. Are natural areas being sampled wisely by the total field studies centre network in any one State?

In each State of Australia (with the possible exception of Queensland) development of field studies centres has been an ad hoc process, and it is inevitable that certain habitats will lack a centre, and that duplication will exist. In Tasmania, for example, eight out of eighteen centres are in a marine environment, while areas like the West Coast and Lake St. Clair remain unserviced. Furthermore, it is essential that not only natural areas be sampled, but urban ones as well.

3. Is the present network fulfulling educational needs? How far does the expansion need to go?

In each State the answer is definite: the network is most inadequate. And in terms of community provision, the network is almost non-existent. However, community demands are slight, and until a trial term of the community centre in Bouddi National Park (New South Wales) has been assessed, needs in this area are difficult to estimate.

Opinions differ on the expansion of each network. Tasmania has three officially designated field study centres, but still sees the need for a total of twenty to adequately sample the diversity of environments and service the State's schools. Queensland still has plans for expansion on a systematic basis but is slowed up by lack of finance. New South Wales has closed its doors to expansion of any kind and is looking to a more efficient use of its existing centres. Victoria, with its extensive camping programme, is in greater need of teacher training to mount effective programmes in the camps, while Western Australia too is in need of trained staff. South Australian teachers see the need for only a few centres of the fixed, staffed, Arbury Park type, and prefer to use their own choice of camping sites. However, the need as they see it is for consultants to advise on how to use the areas available.

The need for expansion exists, but this should be prefaced by

(i) a clear statement of policy on the function of field studies centres,
(ii) trained personnel,
(iii) adequate finance

4. Do field studies centres need to be in National Parks?

For centres administered by the Department of Education, the answer is, No. The Department of Education has sufficient resources, in terms of land, to meet present policies. However, in terms of long-term planning, for a network which samples a diversity of habitats, and is meeting the needs of teachers in all regions, land should be set aside now for centres which may not be developed for another ten years. Victoria has such land set aside in the Education Areas.

No state of Australia is so lacking in natural areas that it needs to use land under the control of the National Parks and Wildlife Service. However, the advantage to be gained by the establishment of centres in National Parks is in terms of management of the resource.

The N.P.W.S. of South Australia saw a joint policy with the Department of Education as a sound proposition; the Parks system samples the diversity of habitats in the State, centres would be built and maintained by the Service, staff would be provided by the Department of Education.

Another advantage to be gained by the establishment of centres in National Parks would be the provision of centres for the general public — not interpretive centres, but environmental study centres. Finance at present is a problem for the Service in each State, but if provision for community needs was seen as important by the Government, then the N.P.W.S. is the logical administrative body for a community network. One ranger in Cleland Conservation Park (South Australia) stated that Parks people should undertake responsibility for total community environmental education with perhaps a seconded teacher to help with extra school groups.

5. Are the field studies centres showing a pattern of development that is consistent with a wise use of resources?

Consider firstly each individual centre.

Only Queensland makes provision for a centre to have enough land so that one section is being "rested" for 12-18 months. For all other centres in Australia, over-use of the resource is always a possibility, except where diversity of habitat exists within the one centre.

Consider secondly the development of a state network of centres. No State except Queensland has a policy on the development of a State network, so establishment of centres has been an ad hoc process with no plans to sample a variety of habitats. However, at the present, existing centres are not in fragile areas, and the relatively small number in operation means that no resources are threatened.

However, consideration should be taken *now* for expansion during the next two decades and a policy based on a wise selection of sites must be developed before land developers take over.

6. Are the field studies centres staffed by New South Wales education officers achieving their objectives as they relate to visiting school children?

This question refers to the study reported in Chapter 12.

The study showed, for children visiting one centre, that the objectives of the centre are achieved, and significantly so, if the visit to the centre is part of a programme drawn up by the centre staff and classroom teacher in consultation.

18.2 Limitations of the Study

Limitations of the study arose because the researcher attempted an Australia-wide study while already employed in a full-time lecturing position. For obvious reasons a study of this kind should not extend over more than two years, but better sampling of each State could have been accomplished if more time had been available.

1. An assessment of *needs* should have been made by formulating a questionnaire to be sent to
   - (a) a sample of public school teachers, primary and secondary
   - (b) a sample of independent school teachers, primary and secondary
   - (c) a random group of school principals
   - (d) lecturers in teacher training institutions
   - (e) members of the general public, selected at random
   - (f) members of community groups.
2. The critical evaluation of the system in each State was not based on objective measurements, but based rather on the results of interviews with key people in the State who may not have reflected all the possible points of view.
3. A number of institutions and centres contacted by letter failed to reply to requests for information.
4. The study of children visiting New South Wales centres was inadequate in terms of being able to make generalizations. The study, involving two centres, was sufficient work on its own for two years, and the failure of the Armidale centre to meet sampling requirements compounded the problem of inadequate numbers for the final assessment.

18.3 General Conclusion

The field studies centre network in each State of Australia is focussed on the formal education sector, yet is inadequate even to meet the needs of all teachers and their pupils.

High level policies need to be made on environmental education programmes for primary and secondary pupils, the expansion of the field studies centre network, and provision for the general public.

Research is needed on the specific abilities of individuals of all ages to assimilate the concepts of environmental education and to develop the skills needed to solve environmental problems and make decisions on environmental issues.

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APPENDIX A

The Binna Burra Environmental Study Centre — A Teachers' Guide to Environmental Education at Lamington National Park

A. Introductory — "Who and What am I"
"What is the Park"

The activities provide a chance to become acquainted with the Park and the things it contains. They also encourage the student to discover things about himself and his attitudes.

A-1 All-day hike with lunchtime discussion on the Park and how the aborigines managed here.
A-2 Find a place in the bush. Creative writing.
A-3 Short walk in the bush to list all the things that are useless. Discussion afterwards to discover that only certain man-made things in the bush are useless.
A-4 Goodies and baddies in nature.
A-5 Noah's Ark. Pairs of cards with same animal on each card. Hand out. Have to find partner without speaking.
A-6 Meet a tree.
A-7 Walk the senses trail
A-8 Walk at night

B. "There is no such thing as a free lunch."

Activities in this section encourage the student to explore the concepts of inter-relationships and interdependence. They should encourage thoughts about the "ecosystem" and ecology.

B-1 Working out food chains and a food web.
B-2 Showing our dependence for all food on natural things.
B-3 Working out specific local food chains.
B-4 Man's impact. Take a walk from the Centre up to the Lodge, down the steps between the cabins 7 and 8, down the track beside cabin 14 and round the senses trail. List all the things changed by Man.
B-5 Earth — activity on soil.
B-6 Water — investigate the water supply and sewerage disposal.
B-7 Fire in the Park.
B-8 Air — oxygen and carbon cycles. Pollution.

N.B. This section shows emphasis on training for decision making.

The Binna Burra Environmental Study Centre would be a waste of time and money if there was nothing we could do to improve our environment.

The world is faced with innumerable environmental and ecological problems — some of which are at crisis point, some of which may prove to be no problem after all.

There is the danger that we might wring our hands in despair and say, "There's nothing we can do." In most cases, there **is** something we can do. There is still time to locate the problems, evaluate the alternatives and to act positively.

This section will draw on the student's experience at the Study Centre to start him thinking about his future role in the world. Hopefully, it will demonstrate that there is much that the individual can and must do.

C-1 Survival. Planning — social, economic, education — all the needs for a group of people isolated in Lamington National Park for 20 years while World War III is on.
C-2 Gather at a lookout. Imagine the group owns the land. Teacher buys it then tells of major development plans for the area. Are students still happy with the price they received for the land?
C-3 Land planning through role playing.
C-4 Planning through environmental design. Each student decides on the land use plan which would best benefit his own interest (assuming role he played in C-3). Then using a list handed out, each student raises his own land use plan.
C-5 Day tour to Paradise?
Day tour to the Gold Coast for a contrast — an urban study.

APPENDIX B

OUTDOOR EDUCATION PROJECT

"The Orphanage",
181 Goodwood Road,
MILLSWOOD SA 5034

STANDING CAMPS FOR USE BY SCHOOLS

This list is published to help teachers plan for Outdoor Education experiences in standing camps. We hope that some of the little known and used camps will recieve more use and the pressure reduced on the better known camps.

Some information on many of the camps included in this list is contained in a Camping Directory published by the Division of Tourism and Sport and available from State Information Centre, 25 Grenfell Street, Adelaide for $1.

More detailed information on facilities and activities for each camp is available from the Outdoor Education Project Team and will be published in due course.

The information in the right hand column is

A — fully catered camp with all equipment supplied
B — not catered but most equipment supplied in kitchen
C — not catered and necessary to bring crockery, cutlery, cooking equipment as well as sleeping bags.

The number refers to the maximum number that can be accommodated — usually determined by the number of beds.

Copies of this list are available from the Outdoor Education Project Team.

NAME	CONTACT FOR BOOKINGS	LOCATION	TYPE NO.
Adare Conference Centre	Methodist D.C.E. 35 Pirie Street, ADELAIDE. 212 4071	Fleurieu Peninsula	A 80
Adelaide Youth Hostel	Youth Hostels Association, 72 South Terrace, ADELAIDE. 51 5583	Adelaide	B 16
Angas River Rec. Centre	S.A. Community Rec. Ass. 109 Woodville Road, WOODVILLE. 5011 45 6097	S. Mt Lofty Ranges	A 60
Angorichina Hostel	Mr. Ratcliffe, ANGORICHINA. Angorichina 1	Flinders Ranges	B 40
Ankara Youth Camp	Box 120, PROSPECT. 5082 44 8066	Lower Murray	B 110
Arbury Park Outdoor Sch.	The Principal, Arbury Park Outdoor Sch. BRIDGEWATER. 5155 339 3987	Mt. Lofty Ranges	A 96
Avon-Klemzig Camp Sch.	Klemzig Primary School, Hay Street, KLEMZIG. 5087 261 1018	Mid North	C 40
Barmera Youth Camp	Quest Educational School Tours 27 Provident Avenue, GLYNDE. 5070 337 3277	Riverland	B 80
Beachport Youth Hostel	Y.H.A., South Terrace, ADELAIDE. 5000 51 5583	South East	B 34
Beltana Field Study Centre	Sue Thorpe, BELTANA. 5730 Beltana 6	Flinders Ranges	C 45 food provided

Black's Waye Chalet	Mr. H. Wagenknecht, 52 Price Avenue, LOWER MITCHAM. 5062 388 1160	Mt. Lofty Ranges	B 78
blinman Hostel	Lewis Bros. Coach Services, 27 Provident Avenue, GLYNDE. 5070 337 3277	Flinders Ranges	B 50
Booloman — Minga Conference Centre	Mr. L. Williams, Box 4, TWO WELLS. 5501 (085) 20 2065	Mid North	A 43
Bowman Park Youth Camp	Mr. L. Muller, 52 Mitchell Street, CRYSTAL BROOK. 5523 086 36 2250	Mid North	B 50
Braund's Cabin Park	Mr. L. Braund PT. VICTORIA. 5537 Pt. Victoria 34 2012	Yorke Peninsula	B 72
Burra-Redruth Camping Centre	Mr. B. Thamm, 2 Sancreed Street, BURRA. 5417 Burra 249	Mid North	C 40
Camp Balaklava	Mr. K. Garow, Box 35, P.O., BALAKLAVA. 5461 (088) 64 5053	Mid North	B 40
Camp Gooden	Mr. R. Brandenburg, 26 King William Road, NORTH ADELAIDE. 5006 267 1412	Mt. Lofty Ranges	C 40
Camp Kedron	Mr. V. Jericho, Box 37, LOVEDAY. 5345 085 88 2182	Riverland	C 100
Camp Loftia	Y.M.C.A. 76 Flinders Street, ADELAIDE. 5000 223 1611	Mt. Lofty Ranges	C 80

Camp Sunshine	Childrens Foundation of S.A. Box 26, WOODVILLE. 5011 268 2068	Mt. Lofty Ranges	B 120
Cape Du Couedic Hostel	National Parks & Wildlife Service, Ranger, Flinders Chase N.P. 5223 Karatta 235	Kangaroo Island	C 8
Central Guest House	Bedford Industries 615 Goodwood Road, PANORAMA. 277 1886	Fleurieu Peninsula	A 100
Chiton Rocks S.L.S.C.	P. Fairchild, "The Orphanage", 181 Goodwood Road, MILLSWOOD. S.A. 5034 74 2708	Fleurieu Peninsula	C 40
Clarendon Camp	Y.M.C.A., 76 Flinders Street, ADELAIDE. 223 1611	Mt. Lofty Ranges	B 50
Clarendon Youth Camp	Mr. D. Rawolle, Box 19, BLACKWOOD. 5051 383 6134	Mt. Lofty Ranges	A 200
Clayton Sea School	Outward Bound S.A., Box 1590 G.P.O., ADELAIDE. 212 1166	Lower Murray	B 32
Coobowie School	Yorketown Area School, Box 104, YORKETOWN. 5576 Yorketown 27	Yorke Peninsula	C 40
Cooranga Camp	Y.W.C.A., 16 Pennington Tce, NORTH ADELAIDE. 267 1445	Southern Adelaide Plains	B 30
C.R. Neilson Camp Centre	Taperoo Primary School, Seabourne Road, TAPEROO. 5017 248 1134	Mt. Lofty Ranges	B 40

Cudlee Creek Camp	Mt. T. Jackson, P.O. Cudlee Creek CUDLEE CREEK. 5253 389 2282	Mt. Lofty Ranges	B 200
Desert Park	Alan Hausler, Box 131, KEITH. 5267 087 56 7042	Upper south east	B 40
Dublin School	Salisbury High School, Farley Grove, SALISBURY NORTH. 5108 258 1077	N. Adelaide Plains	C 40
Eden Valley School	Para Hills West Primary S. Balkara Road, PARA HILLS WEST. 5096 258 2216	Mt. Lofty Ranges	C 40
Emmaus Youth Camp	Methodist Youth Council, 20 Edith Terrace, BALAKLAVA. 5461 088 62 1118	Mid North	C 55
Fainfield Venture Youth Camp	Baptist D.C.E. 61 Flinders Street, 223 2146	Mt. Lofty Ranges	C 20
Forreston School	Croydon High School, Torrens Road, WEST CROYDON. 5008 46 1188	Mt. Lofty Ranges	B 40
Gemini Downs	Mr. B. Tiver, SALT CREEK, Policeman's Point. 75 7013	Coorong	B 45
Glen Haven Venture Park	Mr. R.T. Simms, STOCKPORT. 5410 Stockport 250	Mid North	A 70
Grace Valley Camp	Mr. Robert Wood, 278 5612	Mt. Lofty Ranges	C 52
Hahndorf Holiday Village	Mr. Keith Kennedy, 145A Princes Highway, HAHNDORF. 5245 388 7361	Mt. Lofty Ranges	A 40

Hillfarm Youth Hostel	Quest Educational Tours, 27 Provident Avenue, GLYNDE. 5070 337 3277	Kangaroo Island	B 48
Hoyleton Camp	Church of England Boys Society, 26 King William Street, NORTH ADELAIDE. 5006 267 1412	Mid North	C 24
Inman Valley Field Studies Centre	Youth Hostels Association, 72 South Terrace, ADELAIDE. 5000 51 5583	Fleurieu Peninsula	B 24
Karnkendi Youth Centre	Mrs. P. Hutchesson, YAHL. via Mt. Gambie 5291 YAHL. via Mt. Gambier 5291 087 25 5527	South East	B 80
Kersbrook Youth Hostel	Youth Hostels Ass. 72 South Terrace, ADELAIDE. 5000 51 5583	Mt. Lofty Ranges	C 12
Kuitpo Valley Camp	Central Methodist Mission, 43 Franklin Street, ADELAIDE. 5000 51 5355	Mt. Lofty Ranges	B 54
Kuitpo Youth Hostel	Youth Hostels Ass. 72 South Terrace, ADELAIDE. 5000 51 5583	Mt. Lofty Ranges	C 12
Kursa Youth Camp	Mrs. I. Berzins, 68 Springbank Road, PANORAMA. 5041 277 2757	Southern Adelaide Plains	B 90
Longwood Youth Camp	Churches of Christ D.C.E., 104 Grote Street, ADELAIDE. 5000 51 4036	Mt. Lofty Ranges	B 120
Macclesfield Conference Centre	Congregational Union of S.A., Box 1207, G.P.O. ADELAIDE. 5001 212 4066	Mt. Lofty Ranges	B 60

Mambray Creek School	Daws Road High School, Daws Road, PASADENA. 5042	Southern Flinders Ranges	B 40
Melrose Diocesan Centre	Church Secretary, P.O. Box 96, GLADSTONE. 5473 086 622249	Southern Flinders Ranges	B 80
Mt. Lofty Youth Hostel	Youth Hostels Assn. 72 South Terrace, ADELAIDE. 5000 51 5583	Mt. Lofty Ranges	C 12
Mundallio Station	Hembury Enterprises 9 Whitbread Avenue, KLEMZIG. 261 7051	Southern Flinders Ranges	A 45
Mylor Memorial Youth Centre	Mr. F. Groom, P.O., MYLOR. 5153 388 5234	Mt. Lofty Ranges	A 100
Mylor Recreation Centre	Dept. of Tourism, Rec., and Sport, Miss Benecke, 212 2933	Mt. Lofty Ranges	A 72
Mylor Youth Hostel	Youth Hostels Assn. 72 South Terrace, ADELAIDE. 5000 51 5583	Mt. Lofty Ranges	B 12
Napperby Cub den	Mr. A. Ellery, 23 Plenty Street, PORT PIRIE. 5540 086 32 1515	Southern Flinders Ranges	B 38
Nioka Conference Centre	Presbyterian Church Office, 33 Pirie Street, ADELAIDE. 87 5811	Mt. Lofty Ranges	A 40
Norton Summit Youth Hostel	Youth Hostels Association, 72 South Terrace, ADELAIDE. 5000 51 5583	Mt. Lofty Ranges	B 16

Noonameena Camp	Scripture Union, 42 Grenfell Street, ADELAIDE. 87 3933	Coorong	B 46
North Shields Youth Hostel	Lions Club of Pt. Lincoln Box 991, PORT LINCOLN. 5606 086 82 1003 Jack Thompson	LEyre Peninsula	C 50
Nunyarra	Methodist D.C.E., 33 Pirie Street, ADELAIDE. 212 4071	Mt. Lofty Ranges	A 112
Olave Hills Training Centre	Girl Guides Assn. 278 South Terrace, ADELAIDE. 223 2613	Mt. Lofty Ranges	C 30
Oraparinna Hostel	National Parks and Wildlife Service, 135 Waymouth Street, ADELAIDE. 212 1688	Flinders Ranges	C 32
Para Wirra Youth Hostel	Youth Hostels Assn. 72 South Terrace, ADELAIDE. 51 5583	Mt. Lofty Ranges	C 12
Parnanga Recreation Centre	Dept. of Tourism, Recreation and Sport, Miss Benecke, 212 2933	Southern Metropolitan	B 76
Paxlease Training Centre	Girl Guide Assn., 278 South Terrace, ADELAIDE. 223 2613	Mt. Lofty Ranges	C 30
Pichi Richi Holiday Camp	Hembury Enterprises, 9 Whitbread Avenue, KLEMZIG. 261 0751	Flinders Ranges	A 50
Point Lowly Youth Camp	Lions Club of Whyalla, Box 446, WHYALLA. 5600 086 45 7019 M. Mitchell	Eyre Peninsula	C 48

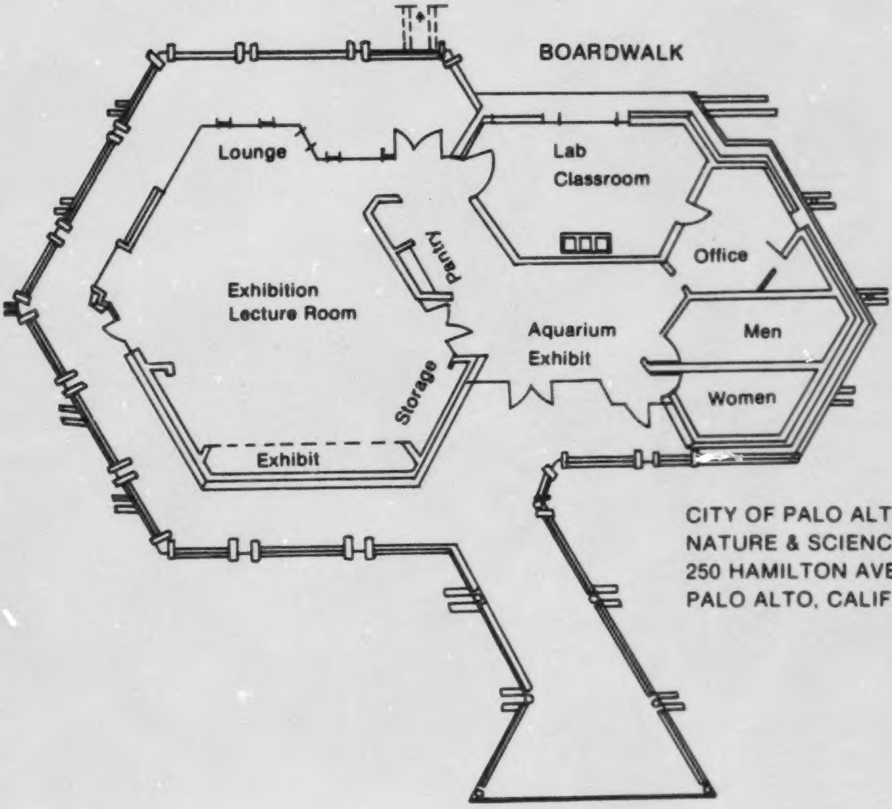
Point Sturt Youth Camp	Churches of Christ D.C.E. 104 Grote Street, ADELAIDE. 51 4036	Lower Murray	B 60
Port Elliot Surf Life-Saving Club	Mr.R. Bruce, Box 371 VICTOR HARBOR 085 52 1628	Fleurieu Peninsula	C 30
Port Vincent Hostel	Girl Guides Assn., Miss Jean Tucker, PORT VINCENT. 5581 Port Vincent 37030	Yorke Peninsula	B 30
Quorn School	Goodwood Boys High School Lily Street, GOODWOOD. 5034 272 4500	Flinders Ranges	B 40
Ranch Youth Camp	Mr. H.R. Barrey, 14 Claire Street, LOWER MITCHAM. 5062 71 9439	Southern Metropolitan	B 80
Rawnsley Park	Mrs. Nobes, RAWNSLEY PARK. Wilpena 48 0008	Flinders Ranges	B 45
Red Cliffs Youth Camp	Mr. J. Lawrie, Box 28, TUMBY BAY. 5605 Tumby Bay 296	Eyre Peninsula	C 40
Red Shield Holiday Centre	Salvation Army, 87 Pirie Street, ADELAIDE. 22 31324	Fleurieu Pen.	B 64
Renmark Youth Hostel	Grimshaws Tourist Camp, P.O. Box 91, RENMARK. 5341	Upper Murray	B 40
Retreat House	Sister in Charge, Retreat House, BELAIR. 5052 278 1631	Mt. Lofty Ranges	A 56
River Valley Ranch	Mrs. Hamilton, SANDERSON. Sanderson 14	Upper Murray	A 40

Robe Youth Centre	Methodist Parsonage, Gough Street, KINGSTON. 5273 087 67 2405	South East	B 60
St. Lukes Camp	Mr. R. Brandenburg, 26 King William Road, NORTH ADELAIDE. 267 1412	Fleurieu Pen.	B 80
Seeonee Hills Cub Scout Camp	Scout Association, P.O. Box 187, STIRLING. 5152 339 3344	Mt. Lofty Ranges	C 56
Sherlock School	Tailem Bend Primary School Wadham Street, TAILEM BEND. 5270 Tailem Bend 148	Murray Mallee	C 40
Southend Youth Camp	Seventh Day Adventist Youth Department, P.O. Box 120, PROSPECT. 5082 44 8066	South East	C 40
State Reception Centre	Mr. Adams, 37 Woodville Road, WOODVILLE. 5011 45 8177	Metropolitan	A 40
Strathalbyn Farm School	Mr. B. Shoesmith, 7 Budhollow Avenue, PARADISE. 5075 337 3431	Fleurieu Pen.	A 60
Stockwell School	Modbury Primary School, Golden Grove Road, MODBURY. 5092 264 2027	Barossa Valley	C 40
Sunset Rock	Presbyterian Church Office, 33 Pirie Street, ADELAIDE. 87 5811	Mt. Lofty Ranges	B 40
Symons House ADELAIDE.	Methodist D.C.E., 33 Pirie Street, 87 4071	Mt. Lofty Ranges	A 30

Tatachilla Camp	Miss R. Hartwich, 205 Halifax Street, ADELAIDE 223 5468	Southern Metro.	B 200
Thuruna Youth Camp	Mrs. L. Harris, LOUTH BAY. 086 84 6053	Eyre Peninsula	B 70
Uralla	Scout Association, Box 187, STIRLING. 5152 339 3344	Mt. Lofty Ranges	C 44
Verdun Outdoor Camp School	Morphettville Park Primary School, Nilpena Avenue, MORPHETTVILLE. 5043 295 1687	Mt. Lofty Ranges	B 40
Victor Harbour Conference Centre (Toc. H)	Toc H (S.A.) inc., 110 North Terrace, ADELAIDE. 51 6781	Fleurieu Pen.	A 96
Vivonne Bay Holiday Park Hostel	Mr. G. Rees, P.M.B. 1, Newland Service, KINGSCOTE. 5223 Phone Harriett 232	Kangaroo Island	A 72
Wardang Island	Wardang Island Tours, 1 Paradise Grove, HIGHBURY. 264 1487	Yorke Peninsula	B 30
Willow Creek Farm	Quest Educational School, 27 Provident Aven, Tours, GLYNDE. 337 3277	Fleurieu Pen.	A 50
Wirrabara Camp	Miss Benecke, Dept. Tourism, Recreation, and Sport. 212 2933	Southern Flinders Ranges	C 12
Woodhouse Memorial Camp	Scout Association, Box 181, STIRLING. 5152 339 3344	Mt. Lofty Ranges	B 35

Woolshed Flat Camp	Dept. Tourism, Recreation, and Sport, 25 Grenfell Street, ADELAIDE. 227 9911	Flinders Ranges	C 50

APPENDIX C


BOARDWALK
Lounge
Lab
Classroom
Pantry
Office
Exhibition
Lecture Room
Aquarium
Exhibit
Men
Storage
Women
Exhibit

CITY OF PALO ALTO
NATURE & SCIENCE DEPT.
250 HAMILTON AVENUE
PALO ALTO, CALIF. 94301

BAYLANDS NATURE INTERPRETIVE CENTER
CONSTRUCTED 1969
COST — $160,000 (approximate)
SQ. FOOTAGE — 3000, including exposed walkways

APPENDIX D

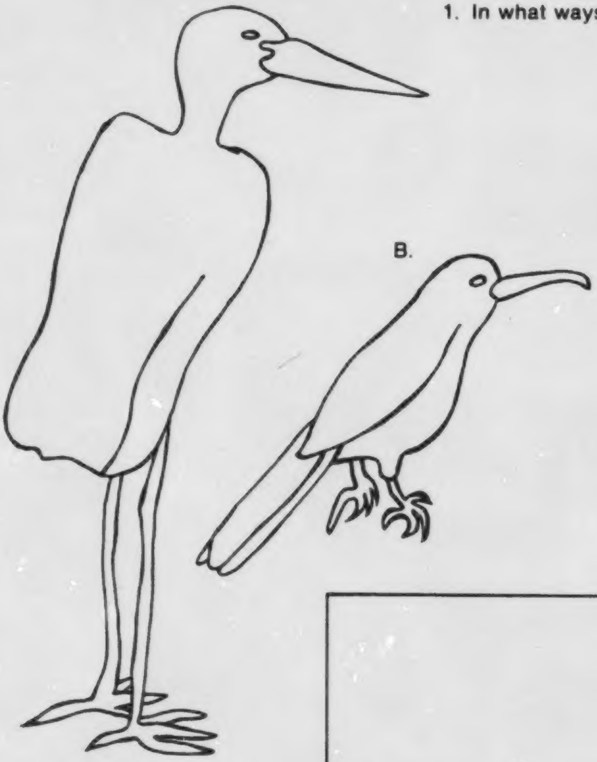
QUESTIONS ABOUT OUR ENVIRONMENT

SET 1

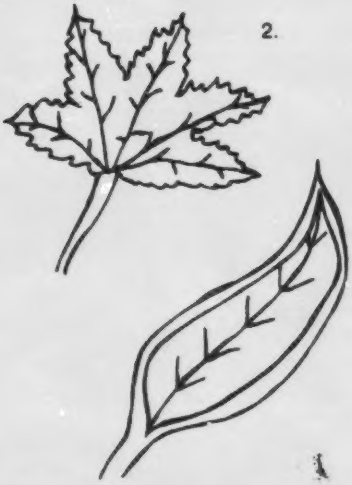
PART 1

Study the pictures on the left, and in the space at the right, write all the **differences** you can see between each pair of objects or organisms.

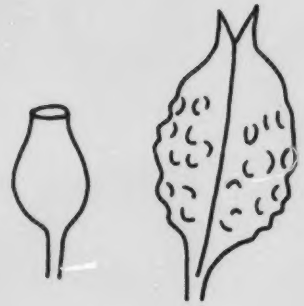
1. In what ways are these two birds different?



2. In what ways are these two leaves different?

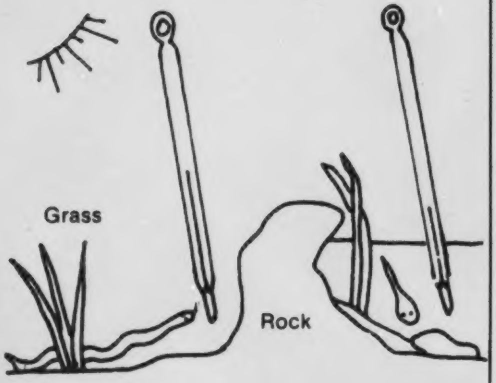


3. These are two hard, dry fruits.



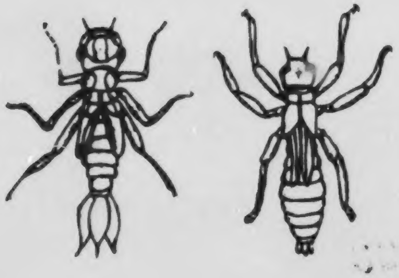
In what ways are they different?

4.



4. In what ways are the two thermometers different?

5.

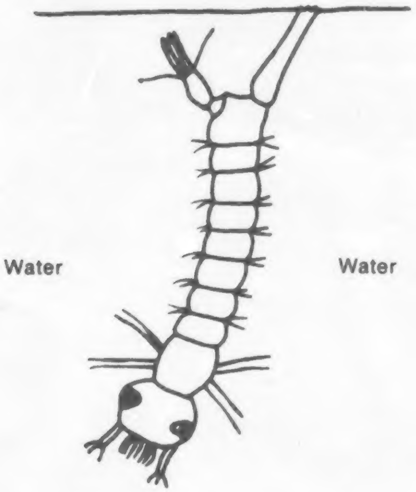


5. In what ways are the two insects different?

PART B

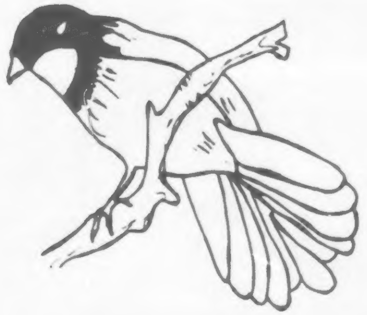
Study the pictures on the left as carefully as possible, and in the space on the right, write down all the things you can see in the picture that tell you something about that plant or animal.

6.

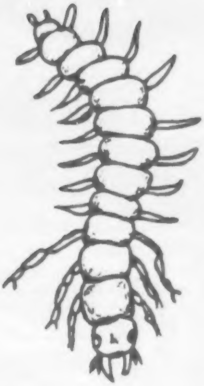
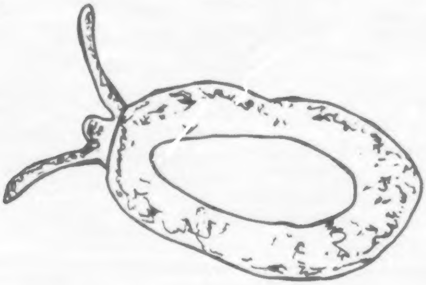
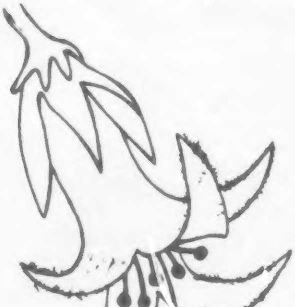


6.

7.



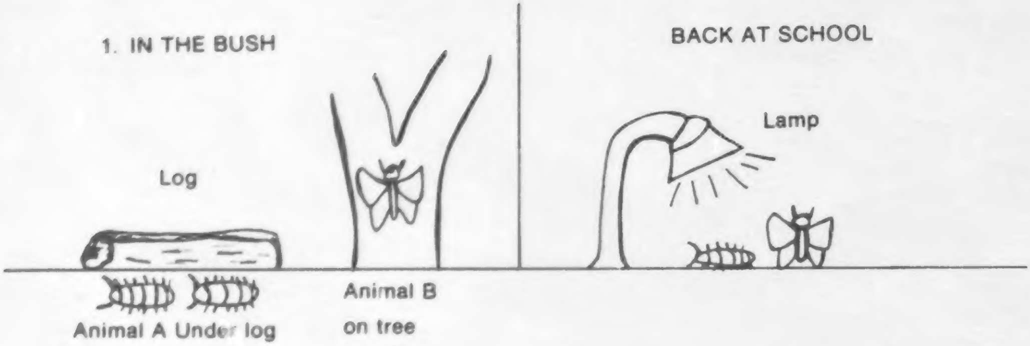
7.

8. 	8.
9. 	9.
10. 	10.

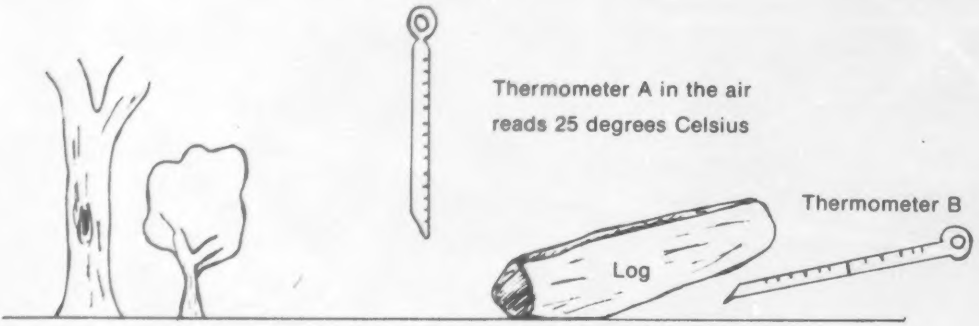
QUESTIONS ABOUT OUR ENVIRONMENT

SET 2

Choose the best answer in each of the following 15 questions.


1. IN THE BUSH
Log
Animal A Under log
Animal B
on tree
BACK AT SCHOOL
Lamp

1. If Animal A and Animal B are placed under a bright lamp back at school, you could expect that —
   - (a) nothing would happen
   - (b) both Animal A and Animal B move away quickly
   - (c) Animal A runs away under a book but Animal B moves to the light
   - (d) both Animal A and Animal B move to the light


Thermometer A in the air
reads 25 degrees Celsius
Thermometer B
Log

2. Which is the correct answer about the picture above?
   - (a) It is a cold day but under the log it will be warmer
   - (b) It is a warm day and under the log the temperature will be about 29 degrees Celsius.
   - (c) It is a cold day and under the log it will be about 18 degrees Celsius.
   - (d) It is a warm day and under the log it will be about 18 degrees Celsius.

3. Human beings should not be wasteful with the things (resources) they take from the environment because —
   - (a) they all cost money
   - (b) there may not be enough left for the future
   - (c) waste always causes pollution
   - (d) everybody in the world already has enough

4. An area of bushland with its plants and animals can survive for years without help from humans. This is because —
   (a) the Sun provides everything the plants and animals need
   (b) the plants and animals depend on each other for most of their needs
   (c) the plants only need the Sun and the animals eat the plants
   (d) sunlight and rainfall are plentiful in areas of natural bushland

5. You have found a small animal in the creek and you wish to know what kind of food it eats. It would be best to —
   (a) find out how many legs it has
   (b) see if it comes to the surface to obtain oxygen
   (c) study the way it moves through the water
   (d) look at its mouth and see if it has jaws or a sucking tube or a row of fine teeth

6. In an area of bushland, the dead plants and animals can be useful to the other plants and animals because —
   (a) dead plants and animals are changed, or decompose, and return the minerals from their bodies to the soil
   (b) dead plants and animals make the air fresh with extra oxygen
   (c) dead plants and animals keep the soil cool by making a shady layer
   (d) dead plants and animals keep the rain off the soil

7. Which of the following sentences is correct?
   → means "is eaten by"
   (a) bird → green plant → insect
   (b) insect → bird → green plant
   (c) green plant → insect → bird
   (d) green plant → tree → bird

8. Imagine you are going for a walk through the park and into the bush. You carefully count how many different kinds of plants and animals you see, even on the ground, and the total number you could count is about —
   (a) 10
   (b) 15
   (c) 20
   (d) 25

9. In your playground and in the bush you should be able to see a lichen. A lichen is —
   (a) a special kind of small green plant usually growing on rocks
   (b) a small insect which is a pest on shrubs
   (c) a small lizard which likes to lie out in the sun
   (d) a kind of mushroom or toadstool

10. All animals are adapted to, or suited to, the environment in which they live. One example of an animal's adaptation to the environment is —
   (a) the special colour an animal has to help hide from its enemies
   (b) the amount of rainfall in one year
   (c) the number of trees in the playground
   (d) the number of worms we can find in a bucket of garden soil

11. Living organisms are often grouped by scientists into two groups called "producers" and "consumers". In the garden or playground outside,
    (a) a tree would be called a consumer and a caterpillar would be called a producer
    (b) a caterpillar would be called a consumer and a butterfly would be called a producer
    (c) a tree would be called a producer and a caterpillar would be called a consumer
    (d) grass would be called a producer and a tree would be called a consumer

12. All living things depend on the non-living environment (the physical environment) for some of their needs. Which answer below correctly lists the things a human being needs from his (or her) non-living environment
    (a) meat, bread, air
    (b) air and water
    (c) bread and water
    (d) meat, bread, air and water

13. If a farmer wants to change an area of forest into grazing land, he must chop down some trees. But if he chops down too many trees —
    (a) the soil is not held in place and is washed away by rain
    (b) the grass cannot grow properly
    (c) the kangaroos have nothing to eat
    (d) strong winds will blow more often and this is harmful to sheep

14. An animal such as a worm living in the soil will find everything there that he needs for living, for example, air, food, water and shelter. The worm will always have enough for its needs because —
    (a) fresh air and rain are always present in sufficient quantities
    (b) the soil always has enough food as long as it rains
    (c) soil never gets used up
    (d) other animals and plants continually provide fresh air and food and the rain brings water

15. Animals and plants on the land need oxygen from the air. This oxygen will never run out or be all used up because —
    (a) green plants give out oxygen as a waste gas during the day
    (b) winds are always bringing in fresh air from outer space
    (c) plants use oxygen at night and animals use it during the day
    (d) tiny organisms called bacteria can change dead plants and animals into oxygen

QUESTIONS ABOUT OUR ENVIRONMENT

SET 3

(i) It has been suggested that areas of the Great Barrier Reef should be destroyed to allow the Government and other agencies to drill for oil. Oil is needed for such essential products as petrol, lubricating oils, and kerosene. Which of the following statements do you believe should be a sensible solution to the problem?

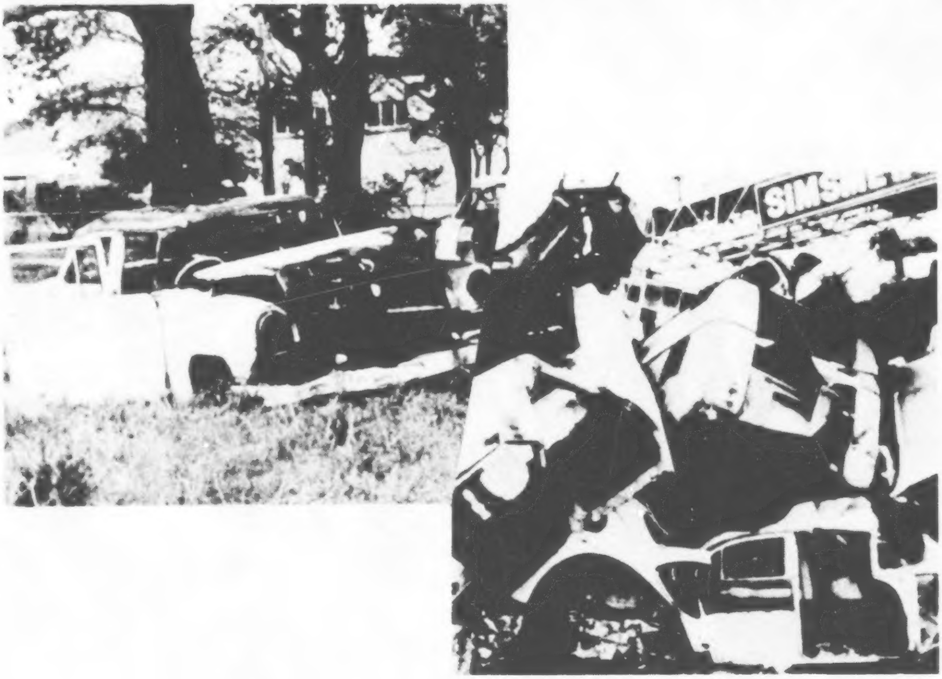
Put a **cross** next to the one you choose.

(a) We should drive our cars less often to reduce use of petrol and so save the Barrier Reef.

(b) Oil is an essential product, expensive to buy overseas, so we must sacrifice parts of the Barrier Reef.

(c) The Government should buy all our oil from overseas.

(ii) In the space below, explain why you chose that answer about the oil problem.



(i) Place a cross next to all the following sentences with which you **agree.**

Do not put a cross if you think the sentence is wrong.

(a) All old cars should be taken to scrap metal merchants.

(b) There is plenty of bush in Australia so it is all right to leave some of our old cars there.

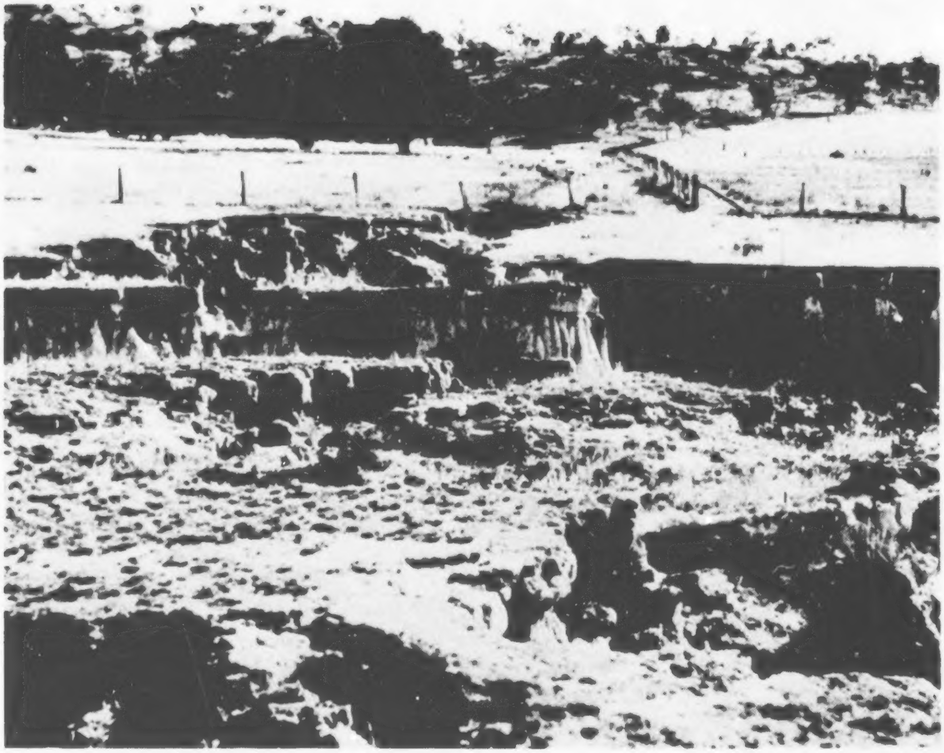
(c) It is all right to leave an old car in a park or in the bush as long as you don't get caught.

(d) People who leave old cars anywhere in the natural or built-up environment should pay a large fine.

(e) People with an old car should pay a fee of $100 to have it taken by ship out to sea and dropped overboard.

(f) The Government should be responsible for removing old cars left in parks and vacant blocks of land and other such places.

(ii) Write in the space below what you think about the pictures above.



What you see here happened because at the end of last century, the owners of the land bought too many sheep for the size of the farm. It has been said that this was due to either ignorance or greed, or both of these things. Do you think this is a fair criticism? (Say "Yes" or "No") .... Do you think a person is responsible for what happens to the country in the future? (Say "Yes" or "No").

Write your story about what you think should have been done on this farm.

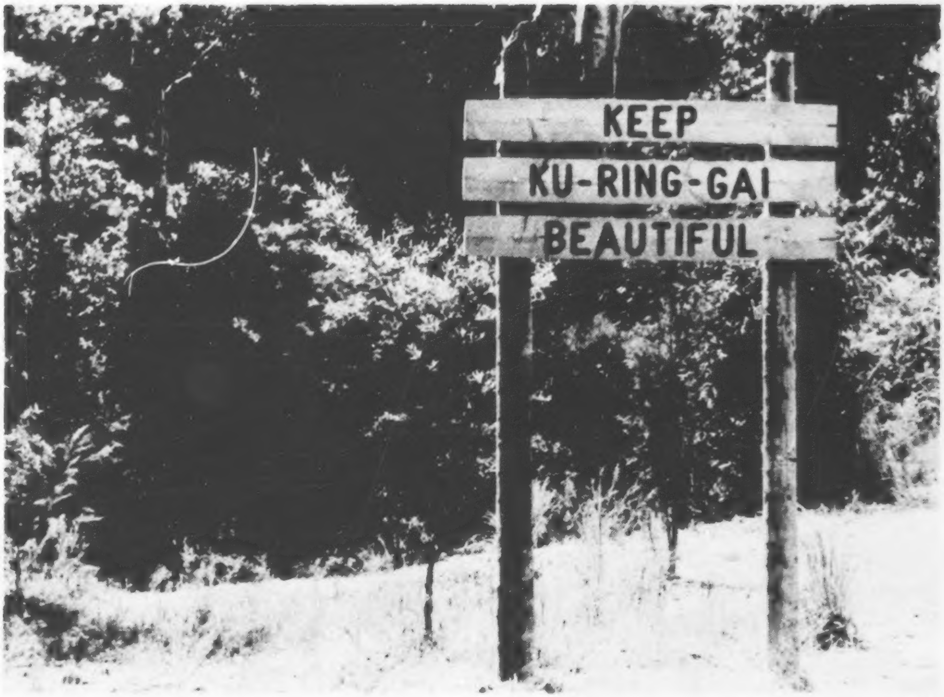
____

____

____

____

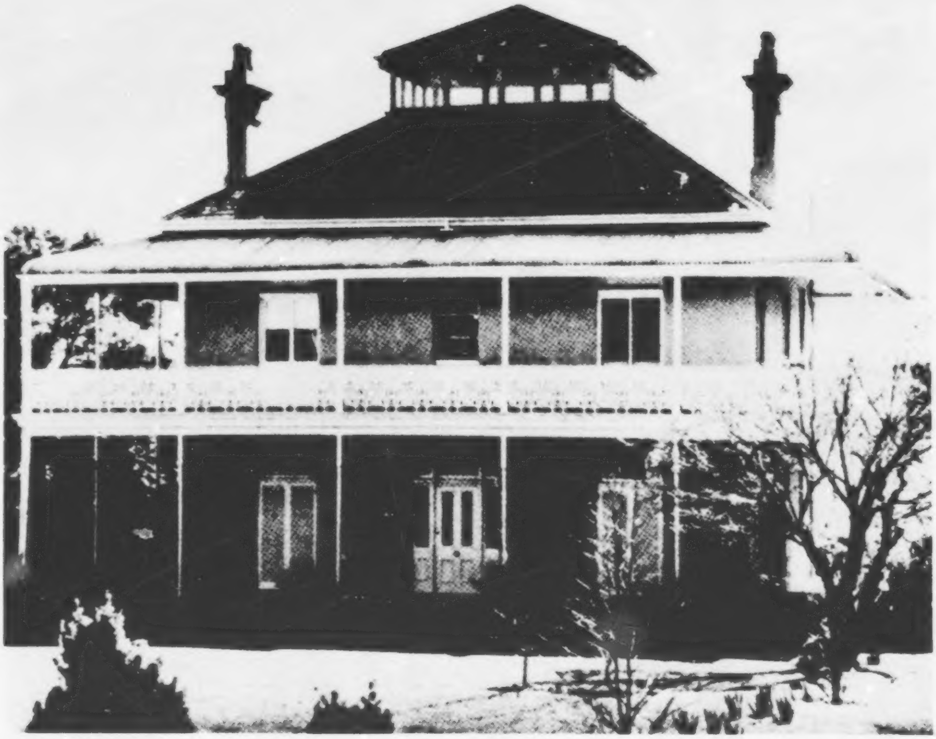
____



(i) In this district, the notice has been erected by Ku-ring-gai Council. Who is responsible for keeping Ku-ring-gai beautiful? Choose the **one best** answer in the following:

- (a) the nearby residents
- (b) people who travel through the area
- (c) the local government
- (d) all of the above
- (e) none of the above

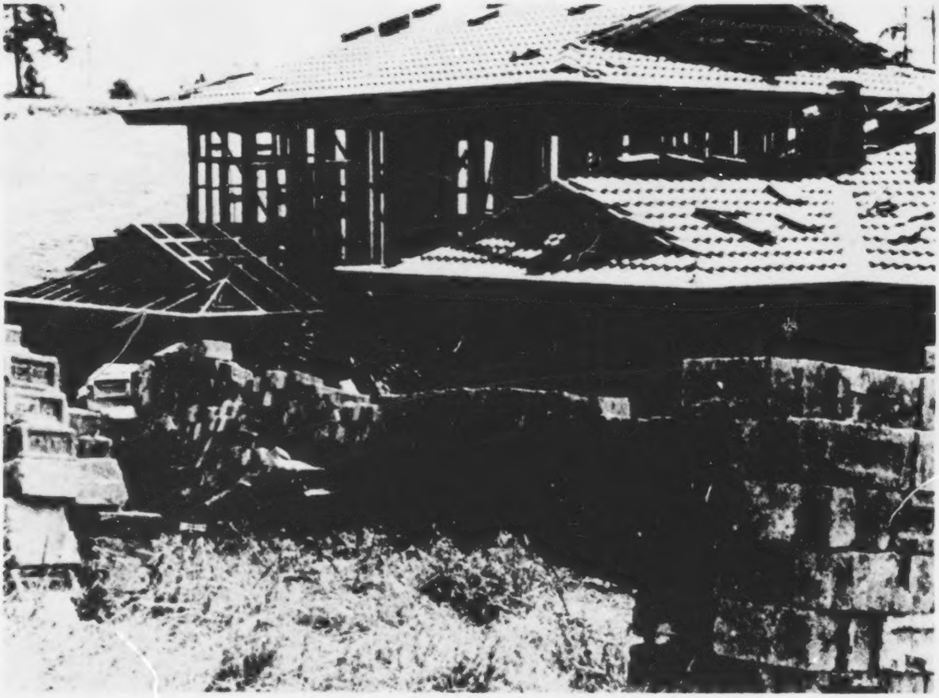
(ii) If this notice was in your neighbourhood, what would you do in order to obey what it says?



Geoff and Andrew walked past the building shown in the picture. Geoff said, "I hear this building is being pulled down so a finance company can build a block of flats. I think that is a jolly shame". Andrew replied, "Why should we keep an old building like that when so many people want somewhere modern to live? I think it should be pulled down."

Do you agree with Geoff or Andrew?__________

Give reasons for your answer.



This was an area of natural bushland on the outskirts of a country town. It was the only area for hundreds of miles around where a certain kind of tree could be found, a tree used for food and shelter by some rare rosellas (native birds).

Here are some opinions about what happened, written by people living in the town.

1. A member of the local council said the council needed the money from taxes paid by the new home owners.
2. The local builder said he would earn a lot of money from building the houses.
3. The local chemist said the houses could have been built on the other side of town, even if it was further to travel from the centre of town.
4. .The bank manager said it is not possible to save all the natural areas in New South Wales From your point of view, which of the above four peop'e has the most sensible opinion?_________

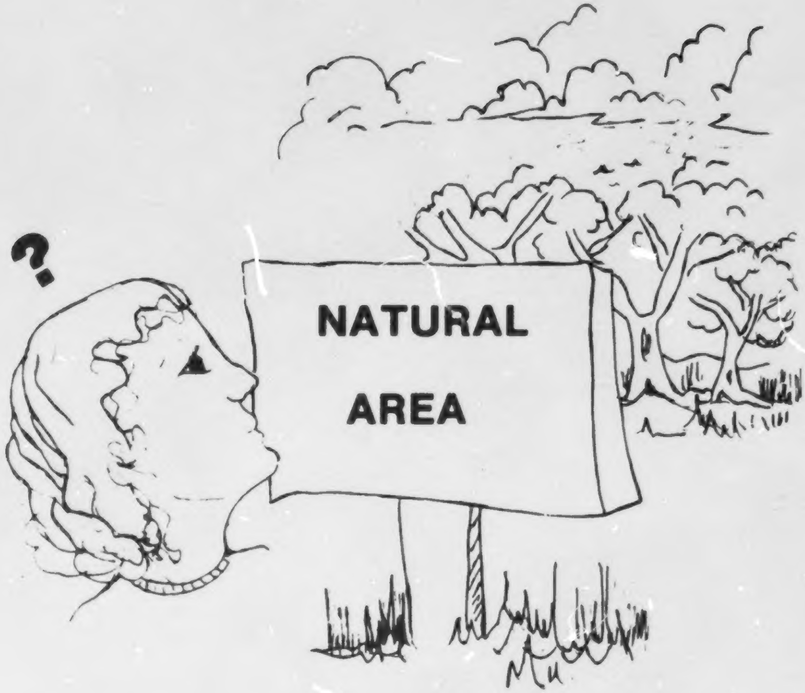
What do you think should be done about saving naturalness and yet still be able to build homes for people?

____

____

____

THINKING ABOUT OUR ENVIRONMENT


?
NATURAL
AREA

What are your thoughts about the environment? Here are some ideas for which you can vote. You must vote for all ten ideas. Place your voting number in the space at the right hand side.

Vote 3 if you **agree very strongly** with the idea.

Vote 2 if you **just agree** with the idea.

Vote 1 if you do **not** agree with the idea.

Vote 0 if you **disagree strongly** with the idea.

1. If we collect animals from the seashore or creek or bush, we should return them after studying them. ____________ ____________
2. Visitors should carry out their own litter (or place it in bins if they are provided) when in any area of bushland, not just parks and reserves. ____________ ____________
3. The best way to enjoy a wilderness area of untouched bushland is by 4-wheel vehicle. ____________ ____________
4. The people of to-day should try to save areas of natural bushland so that people of the future can enjoy them too. ____________ ____________
5. A good place to leave unwanted domestic cats is in the bush. ____________ ____________
6. Shooting native animals for sport is O.K. as long as you are careful with the guns and no one gets hurt. ____________ ____________
7. It is a good idea to save some of our buildings so that people in the future can better understand their history. ____________ ____________
8. Trees and rocks are not important like animals so people should be allowed to scratch their names on them. ____________ ____________
9. It is quite O.K. to throw your empty drink can in the school garden or out the car window as long as no one sees you do it. ____________ ____________
10. Two friends on a hike through a nature reserve saw two children picking the protected flowers. They decided to tell them they should not do that. ____________ ____________

MAILING LIST - NEW SOUTH WALES

1. Arrawarra Field Station (U.N.E.) Centre is near Coffs Harbour. Contact Department of Zoology, University of New England, Armidale, N.S.W. 2351.
2. Awabakal F.S.C. Boundary Street, Dudley, N.S.W. 2290.
3. Brewongle F.S.C. Sackville Road, Sackville North, N.S.W. 2756.
4. Bournda F.S.C. Jellat Jellat via Bega, N.S.W. 2550.
5. Dorroughby F.S.C. Mullumbimby Road, Dorroughby, N.S.W. 2480.
6. Longneck Lagoon F.S.C. Whitmore Road, via Riverstone, N.S.W. 2765.
7. Muogamarra F.S.C. Pacific Highway, Cowan, N.S.W. 2252.
8. Thalgarrah F.S.C. Rockvale Road, Armidale, N.S.W. 2350.
9. Royal National Park F.S.C. P.O. Box 41, Sutherland, N.S.W. 2232.
10. Wambangalang F.S.C. Obley Road, Dubbo, N.S.W. 2830.
11. Wirrimbirra F.S.C. Hume Highway, Bargo, N.S.W. 2574.
12. Borambola Sport & Recreation Centre, R.M.B. 660A, Tarcutta Road, Wagga Wagga, N.S.W. 2650.
13. Broken Bay Sport & Rec. Centre, C/o P.O. Brooklyn, N.S.W. 2253.
14. Bumberry (Parkes), C/o Dulwich High School, Seaview Street, Dulwich Hill, N.S.W. 2203.
15. Lake Burrendong Sport & Rec. Centre. C/o P.O. Mumbil, 2815.
16. Chakola, P.O. Box 24, Kangaroo Valley, N.S.W. 2577.
17. Jindabyne Sport & Rec. Centre, C/o P.O. Jindabyne, 2627.
18. Lake Ainsworth Sport & Rec. Centre, C/o P.O. Lennix Head, via Ballina, N.S.W. 2478.
19. Lake Keepit Sport & Rec. Centre, C/o P.O. Gunnedah, 2380.
20. Little Wobby Sport & Rec. Centre, C/o P.O. Brooklyn, 2253.
21. Myuna Bay Sport & Rec. Centre, P.O. Box 37, Dora Creek, N.S.W. 2264.
22. Narrabeen Lakes, P.O. Box 57, Narrabeen, N.S.W. 2101.
23. Newholme (U.N.E.) Centre is at Armidale. Contact Faculty of Resource Management, University of New England, Armidale, 2351.
24. Pappinbarra F.S.C. P.O. Box 430, Port Macquarie N.S.W. 2444.
25. Crommelin Biological Research Station P.O. Pearl Beach, 2256.

26. Point Wolstoncroft Sport & Rec. Centre, C/o P.O. Gwandalan, N.S.W. 2259.

27. Smiths Lake (near Forster, N.S.W.) Contact Department of Zoology, University of New South Wales, Anzac Parade, Kensington, 2033.

28. Yarrawood Conference Centre. Contact Sydney Teachers College, Manning Road, Sydney University.

29. Yerranderie Village (via Oberon), C/o Miss Val Lhuede, 2 Parkes Street, Kirribilli, N.S.W. 2061.

30. Yarrahapinni, Grassy Heads via Kempsey. Enquiries: 'Dulwich', Singleton, 2330.

31. Neal Lodge, Scotts Head Road, via Macksville, P.O. Box 184, N.S.W. 2447.

32. Tiona Park Environmental Reaching Centre, Lakesway, via Forster, 2428.

33. Camp Knox (Hawkesbury River) C/o Knox Grammar School, Pacific Highway, Wahroonga, 2076.

34. Centre for Natural Science and Mathematics Education, Armidale C.A.E. Armidale, N.S.W. 2350.

35. Ravensdale, C/o Henry Kendall High School, Faunce Street, Gosford, N.S.W. 2250.

36. Canberra C.A.E. (Jervis Bay), P.O. Box 381, Canberra City, A.C.T. 2601.

37. Millamurra, Epping Boys' High School, Epping Road, Eastwood, 2122.

38. Wedderburn Outdoor Resources Centre, C/o Woodland Road, Public School, Woodland Road, South Campbelltown, N.S.W. 2560.

MAILING LIST — QUEENSLAND

1. Dunwich Research Station, Stradbroke Island, Queensland 4163.
2. Eprapah F.S.C. Colburne Avenue, Victoria Point, Redlands Shire, Queensland, 4165 (Scout Association).
3. Fortitude Valley F.S.C. C/o Fortitude Valley, State School, Brookes Street, Fortitude Valley, Queensland, 4006.
4. Heron Island Research Station, via Gladstone, Queensland, 4680.
5. Jacob's Well F.S.C. M.S. 35 Beenleigh, Queensland 4207.
6. Maroon Outdoor Education Centre, Maroon Dam, Near Boonah, Queensland, 4310.
7. Stanley River F.S.C. via Kilcoy, Queensland, 4515.
8. Numinbah Valley F.S.C. Numinbah Valley M.S. 208 via Nerang, Queensland 4211.
9. Sunday Creek F.S.C. M.S. 16 Maleny, Queensland, 4552.
10. Amaroo F.S.C. via Kleinton, Queensland, 4352.
11. Dunwich Field Study Centre, C/o North Brisbane C.A.E. P.O. Box 117, Kedron, 4031.
12. Bunyaville F.S.C. C/o Agricultural Project Club Branch, Department of Education, P.O. Box 33, North Quay, Queensland 4000.
13. Ironbark, C/o St. Peter's Lutheran College 66 Harts Road, Indooroopilly, Queensland 4068.
14. Moogerah Dam, C/o Brisbane Boys' College, 59 Kensington Terrace, Toowong, Queensland 4066.
15. Atkinson Dam, C/o Queensland Institute of Technology, George Street, Brisbane, Queensland 4000.
16. Mary River F.S.C. A Flat Camp, Galangowan, C/o P.O. Goomeri, Queensland, 4601.
17. Boyne Island F.S.C. Boyne Island, Queensland, 4679.
18. Townsville Environmental Education Centre, C/o Edwin Centre, Townsville West State School, Ingham Road, Townsville, Queensland, 4810.
19. Columboola F.S.C. Columboola, Queensland, 4414.
20. Camp Fairburn, C/o Emerald State High School, Emerald, Queensland, 4720.
21. Binna Burra Environmental Studies Centre, C/o Tony Groom, Binna Burra Lodge, Lamington National Park, via Beechmont, Queensland, 4211.
22. Camp Bornhoffen (Police Department), G.P.O Box 1440, Brisbane, 4001.
23. Pepperina Hill, C/o Brisbane Grammar School, Greg Terrace, Brisbane, 4000.
24. Peel Island, C/o Church of England Grammar School, Oaklands Parade, East Brisbane, 4169.

MAILING LIST — SOUTH AUSTRALIA

1. Arbury Park Outdoor School, Arbury Park Road, Bridgewater, S.A. 5155.
2. Para Wirra Study Centre, C/o Smithfield Plains, S.A. 5114.
3. Cape Jervis, C/o Marion High School, York Avenue, Clovelly Park, S.A. 5042.
4. Coobowie, C/o Yorketown Area School, Box 104, Yorktown, S.A. 5576.
5. Quorn Outdoor Education Centre, Quorn, S.A. 5433.
6. Cockatoo Valley Education Centre, Balmoral Road, Cockatoo Valley, S.A. 5351.
7. Forreston School, C/o Croydon High School, Torrens Road, West Croydon, S.A. 5008.
8. Wardang Island, C/o Wardang Island Tours, 1 Paradise Grove, Highbury, S.A. 5089.
9. Kapunda Convent, C/o Para Vista High, Wright Road, Para Vista, S.A. 5093.
10. Mambray Creek School, C/o Daws Road High School, Daws Road, Pasadena, S.A. 5042.
11. Verdun Outdoor Camp School, C/o Morphettville Park Primary School, Nilpena Avenue, Morphettville, S.A. 5043.
12. Eden Valley School, C/o Para Hills West Primary School, Balkara Road, Para Hills West, S.A. 5096.
13. Dublin School, C/o Salisbury High School, Farley Grove, Salisbury North, S.A. 5108.
14. Avon-Klemzig Camp School, C/o Klemzig Primary School, Hay Street, Klemzig, S.A 5087.
15. Robe, C/o Grant High, Hosking Street, Mt. Gambier S.A. 5290.
16. C.R. Neilson Camp Centre, C/o Taperoo Primary School, Seabourne Road, Taperoo, S.A. 5017.
17. Sherlock School, C/o Tailem Bend Primary School, Wadham Street, Tailem Bend, S.A. 5270.
18. Narinyeri, C/o Murray Park C.A.E. 15 Lorne Avenue, Magill, 5072.
19. Woods Point Camp School, C/o Christie's Beach High, Christie's Beach, 5165.
20. Stockwell School, C/o Modbury Primary School, Golden Grove Road, Modbury, 5092.
21. Clarendon, C/o Glengowrie High, Southern Avenue, Glengowrie, S.A. 5044.
22. Kangaroo Island Outdoor Education Centre, C/o Parndana Area School, Parndana, Kangaroo Island, S.A. 5220.
23. Goose Island, C/o Scotch College, Carruth Road, Torrens Park, S.A. 5062.

MAILING LIST — TASMANIA

1. Waddamana Field Study Centre, Waddamana, Tasmania 7411.
2. Molesworth Environment Study Centre, C/o Molesworth Primary School. Molesworth, Tasmania, 7451.
3. Marine Studies Centre, Jetty Road, Woodbridge, Tasmania, 7162.
4. Hagley Environment Centre, Hagley, Tasmania, 7257.
5. Port Sorell Camp C/o Senior Recreation Officer, Division of Recreation, 51 Alexander Street, Burnie, Tasmania, 7320.

6. Conningham C/o Senior Recreation Officer,
Division of Recreation,
7. Conningham) Kirksway House,
Kirksway Place,
8. Rheban Cabin) Battery Point,
9. Esperance) Hobart, 7000.

9. Bruny District School Field Studies Centre, C/o Bruny District School, Alonnah, South Bruny, Tasmania.

10. Dover, C/o Clarence High School, Wentworth Street, Bellerive, Tasmania, 7018.

11. Mt. Cameron, C/o Scottsdale High School, Scottsdale, Tasmania, 7254.

12. Storey's Creek, C/o Riverside High School, Riverside, Tasmania, 7250.

13. Guildford Centre, C/o Burnie High School, Burnie, Tasmania, 7320.

14. Kelso Camp, C/o St. George's Special School, Amy Road, Newstead, Launceston, Tasmania, 7250.

15. Sprent Field Study Centre, C/o Sprent District School, Sprent, Tasmania, 7315.

16. Swansea, C/o Dominic College, P.O. Box 256, Glenorchy, Tasmania, 7010.

17. Rowallen Hut, C/o St. Patrick's College, Prospect, Launceston, Tasmania, 7250.

18. Mt. Arthur, C/o Launceston Grammar, Mowbray, Launceston, Tasmania, 7250.

MAILING LIST — VICTORIA

1. Bogong School Camp, Bogong, Victoria, 3699.
2. Noojee Outdoor Education Centre, C/o Melbourne State College, Cnr. Swanston & Grattan Streets, Carlton, Vic. 3053.
3. Somers School Camp, Somers. Vic. 3927.
4. Whipstick Environment Centre, Bendigo, Vic. 3550.
5. Coolart (proposed) for information contact E.S.A.V. P.O. Box 845J, Melbourne, Vic. 3001.
6. Highfield (proposed), Contact National Parks Service, 240 Victoria Parade, East Melbourne, 3002.
7. Faraday, C/o Castlemaine Primary School, Castlemaine, Vic. 3450.
8. Timbertop, C/o P.O. Mansfield, Vic. 3722.
9. Tecoma School Camp, C/o Melbourne High School, Melbourne, Vic. 3000.
10. Glenewart (proposed) contact E.S.A.V. P.O. Box 845J, Melbourne, Vic. 3001.
11. Geelong & District Natural History & Environment Centre, (Proposed), Geelong, Vic. 3220.
12. Phillip Island (proposed), contact C. Nancarrow, Wildlife Management Officer, P.O. Box 271, Cowes, Vic. 3922.
13. Grampians Environ. Studies Centre, P.O. Box 55, Dunkeld, Vic. 3294.
14. Delaney Environ. Education Centre, Beechworth, Vic. 3747.
15. Tallangatta Conference Centre, R.M.B. 2130, Tallangatta, Vic. 3700.
16. Rubicon School Camp, R.S.D. Thornton, Vic. 3712.
17. Tanjil Bren, C/o Leongatha High School, Nerrana Road, Leongatha, Vic. 3953.
18. Guthridge Environment Centre, C/o Sale Teachers Centre, Princes Highway, Sale, Vic. 3853.
19. Pine Lodge, Inverloch, Vic. 3996.
20. Kerang F.S.C., Macropus Park, Kerang, Vic. 3579.
21. Cuming House, C/o Caulfield Grammar, 217 Glen Eira Road, East St. Kilda, Vic. 3182.
22. Little Desert Lodge, C/o R.C. Reichelt, 26 Brougham Street, Nhill, Vic. 3418.

MAILING LIST — WESTERN AUSTRALIA

1. Jarrahdale) Write to
2. Mundaring Weir) Environmental Education Officer,
"Claver House",
823 Wellington Street,
Perth, Western Australia, 6000.

3. King's Park Education Centre, C/o King's Park Board, King's Park, West Perth, 6005.

4. Tomato Lake Studies Centre, C/o Kewdale Senior High School, President Street, Kewdale, Western Australia, 6105.

5. Camp Schools — write to individual camp,
C/o Physical Education Branch,
"Bridgeway House",
863-867 Wellington Street,
West Perth, 6005.

6. University of Western Australia, Mounts Bay Road, Crawley, Western Australia, 6009.